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On the Poisonous Plants Indigenous to California.*

BY HANS HERMAN BEHR, M.D.

In the present state of our knowledge, the enumeration of the dangerous plants in a new country like California seems to partake somewhat of procrastination; but a beginning has to be made, and the circumstance of our very fragmentary knowledge, when exposed to the view of the profession, will act as a stimulus for the investigation of a matter of such vital importance.

Let us first consider those plants of whose dangerous qualities we might be convinced *a priori*, or which at least belong to genera where analogy with foreign species of the same genus or order justifies us in considering them dangerous.

We have two species of a cucurbitaceous genus, exhibiting a full measure of all the drastic properties developed by some other members of the order, namely, Megarrhiza (according to some botanists, Echinocystis) fabacea and Marah, both species comprised under the vernacular name of Manroot.

The active principle seems to be most developed in the enormous rhizome. The presence of this active principle is the more to be regretted as otherwise the considerable amount of starch contained in these rhizomes would make both of the species valuable food plants, like the yam of the tropics, to which the slender climbing stem proceeding from a giant rhizome bears a kind of external resemblance.

The intense bitterness of the rhizome warns the curious in time and prevents accidents. The stem and leaves seem to be inert. The prickly capsule is full of a saponaceous juice, which disappears with the ripening. Neither the properties of the saponaceous juice nor those of the seeds have been thoroughly examined, and a close investigation may lead to the discovery of some new principle. In the meantime we must suppose that these parts bear an analogy to Colocynthis, in the same way as the rhizome coincides in many points with the root of Bryonia alba.

We have a species of Gratiola—Gratiola ebracteata—but it is doubtful if this little and rather rare annual possesses any of the properties that have given its European congener, Gratiola officinalis, its botanical name and its reputation amongst the farmers of the old Continent.

We have two species of Solanum: Solanum nigrum, the common nightshade; it is not poisonous in California, at least under ordinary circumstances. The same species is common in Europe, where it is considered poisonous.

The second species, Solanum umbelliferum, has not yet been sufficiently investigated. Stem and leaves may act like those of Solanum Dulcamara, the bittersweet of our stores, which it resembles. As to its berries I have no data.

Datura Stramonium (thorn apple) is common enough in some localities, and does not differ in any way from specimens derived from other countries.

Our beautiful Rhododendron occidentale, frequently called Azalea, contains in its roots a narcotic principle not yet sufficiently investigated. It may be that the leaves partake of the active principle contained in the leaves of the Siberian Rhododendron chrysanthum.

Ledum glandulosum (Labrador tea) deserves to be investigated as a narcotic. It resembles Ledum palustre so much that we may expect the same active principle which in mediæval times was used to make beer more intoxicating, and the prohibition of which for this purpose is one of the first instances of a sanitary law. The leaves at present are only in use for killing vermin on cattle, and fleas that infest rural abodes.

Caucalis nodosa and Caucalis microcarpa (yerba de vivora) are firmly believed by our old settlers to be infallible remedies for the bite of the rattlesnake. If they really cure snakebite, or at least diminish its danger, they must possess a power that under ordinary circumstances might do harm. Both the plants comprised under the name yerba de vivora are insignificant-looking annuals, and perhaps owe their reputation to the circumstance that they are strictly vernal and not to be found where snakes are most likely to be met with. But we must not judge *a priori;* investigation may reveal powers which we did not expect in the herb.

The odor of Heracleum lanatum (cow parsnip) causes vertigo in some persons. Although these effects are neither constant nor general, an investigation is recommended, as it is of importance to know the properties of an herb of so frequent occurrence in the neighborhood of habitations.

Our Œnanthe Californica (fool's parsnip), notwithstanding its great resemblance to Œnanthe fistulosa of Europe, seems not to be poisonous.

Sium cicutæfolium (water parsnip) is decidedly poisonous, and the more dangerous as the taste of its root resembles that of parsnip more than any other of the poisonous umbelliferæ. It is probably this plant that caused the disaster of Coyote Creek in the year 1869, where, of a party of six prospecting miners, only three escaped with their lives.

We have three species of Cicuta (water hemlock), all of which, if not poisonous, are at least suspicious. As they are generally found in marshes or in otherwise not very accessible places, they are not apt to cause accidents.

It is not certain that Conium maculatum (the spotted hemlock) is originally a native herb. At present it is very common, and in some localities forms thickets, whose nauseous smell is apt to affect sensitive constitutions. The disagreeable smell, however, serves as a kind of warning and prevents accidental poisoning.

Eremocarpus setiger is used by the Indians to narcotize fish. Its properties otherwise are but imperfectly known. It smells like strawberries, but its dusty, straggling appearance is not calculated to invite passers-by and so cause accidents.

Another euphorbiaceous plant, Hendecandra procumbens (Croton Californicus), is a powerful drastic.

Our native species of Euphorbia are annuals, and I do not think that their milk is acrid enough to do harm, but Euphorbia Lathyris, a kind of spurge introduced from Europe, is a powerful drastic in all its parts. Rats do not like to dig in the ground where this plant grows in sufficient numbers.

Rhus diversiloba (our poison oak or yedra) cannot well be called a poison, as no case is known where this shrub and its exhalations have caused more than the temporary trouble of a skin eruption. All the cases where the eruption became permanent admit of the explanation that a predisposition for cutaneous troubles existed which would have developed sooner or later without having received a start by the action of poison oak.

There does not seem to be anything specific in the action of the shrub. Many people are affected in a similar way by inhaling the vapor of turpentine on visiting a newly painted room. Our poison oak, as well as the Rhus Toxicodendron of the Atlantic States, requires an idiosyncrasy in the individual to act upon, or else it remains inert. I have remarked the same peculiarity in the case of the dreaded Semecarpus of the East Indies, and I should not wonder if the terrors of Rhus caustica in South America and of the Melanorrhœa (the Japanese varnish tree) rest on a similar exaggerated action, and would by a close investigation resolve themselves into an inconvenience befalling only those who are liable to be affected in that way.

As to antidotes, there exists no specific for the cure of the eruption if it is once fairly established. The exanthema has to be treated according to general rules. Nevertheless there seems to be a foundation in the belief of our fellow-citizens of Spanish descent that an infusion of the leaves of Rhamnus Californica (Cascara sagrada), used as a wash, acts as a preventive. But as this remedy, to be of any use, must be applied before the eruption has developed, and as the receptivity for the noxa in the majority of people is altogether wanting, it is difficult to judge about the merits of the application. It is true that I know of a few cases of persons formerly liable to be affected who have been exempt since they have used the wash immediately after each exposure.

The second California species of Rhus, Rhus aromatica, is entirely harmless, and its berries are edible.

Actæa spicata (baneberry) is rather local. The beautiful coral-red berries look inviting enough, but I have never heard of any accident.

A species of Delphinium is dreaded by herders, who frequently lose sheep by this plant, but it is difficult to identify the species from their vague descriptions. All we can make out from their statements is that it must be a perennial, growing, when in flower, above the height of a man.

Our species of Ranunculus lose their poisonous acridity by drying, so that the hay is not affected by their presence.

It is the reverse in regard to our Prunus ilicifolia, a kind of wild cherry, whose foliage develops its poisonous properties only during the process of withering. This peculiarity causes occasionally the loss of a sheep or a cow, because these animals acquire the habit of browsing on the trees that grow near the trail that leads to their pasture grounds, and do so with impunity, until some day they encounter in a tree, on which they have browsed every day, a branch that, perhaps in consequence of an injury, has begun to wither.

* Paper read at the meeting of the American Pharmaceutical Association at San Francisco.

The notorious Loco weed is an Astragalus, but the exact species is not known with certainty. There may be several species of Astragalus that develop a curious poison of exceedingly slow action, corresponding in some way in its effects to a poison observed in some Australian plants of the same leguminous order, belonging to the genera Gastrolobium, Oxylobium, and Isotropis.

Here, as well as in Australia, these plants have been experimented with, but without enabling the investigator to come to any decisive conclusions. Two things, nevertheless, in both countries have been established:

1. Dogs, cats, and rabbits do not suffer if the seeds or herb of these plants are mixed with their food.

2. Cattle, sheep, and horses suffer only in certain seasons.

As to the first circumstance, respecting the established fact that cats, dogs, and rabbits enjoy an immunity in regard to this poison, we only have to recollect that goats eat hemlock, and rabbits belladonna, with impunity, and we will understand that the immunity of these animals does not prove anything as to the dangerous qualities of the same herb in regard to cattle, sheep, or horses.

The other circumstance, that the Loco poisoning only takes place under certain circumstances, and not in every season, admits of several hypotheses. The poisoning may be owing either to the invasion of some fungoid parasite, perhaps of the Claviceps order; or to a substance produced by fermentation or putrefaction, in which case the materia peccans would be some ptomaïne; or, lastly, the poison may not be of vegetable origin at all, but some animal parasite infesting the suspected plant.

The question is a very complicated one, and as Loco poisoning in some years entails a perceptible loss of stock, it is of sufficient importance to justify an appropriation for a body of scientists to inquire into the causes of the malady and find a remedy for them.

The ptomaïne hypothesis would explain the curious slow action and chronic course of the Loco disorder in the affected animals.

In the *American Journal of Pharmacy* (May, 1880) I find a notice to the effect that the efforts of the government of the Australian colony of Victoria to unravel the mystery have brought the matter a step nearer to the discovery of the real cause of these accidents. My old friend, Baron Ferdinand von Mueller, combining his efforts with those of the accomplished chemist, Mr. Rummel, has discovered a peculiar resin and a glucoside in the Australian herbs, which latter is probably the cause of the poisoning.

Polygonum nodosum, an aquatic species of knotgrass, resembles its European congener in appearance and taste; and Polygonum hydropiper, which from its acrid, pungent taste has been named water-pepper, is considered dangerous.

Our two species of Trillium (wake-robin) are suspicious and should be investigated.

The same is desirable in regard to our three species of Fritillaria (chessboard flower), notwithstanding the statement of the Russian traveller and scientist, Pallas, that the inhabitants of Kamschatka eat with impunity the bulbs of our Fritillaria lanicolata, that is found in their country as well as in California.

We have in the Sierras two species of Veratrum undoubtedly poisonous.

In regard to Zygadenus venenosus, the qualities are not sufficiently known. It is certain that the root is as little poisonous to hogs as hemlock is to goats; but in Oregon and Northern California, where the edible bulb of Camass (Cyanotris esculenta) forms an article of food to Indians, and frequently occurs in company with Zygadenus, the latter is called Death-Camass. [See paper on "Zygadenus Nuttalii," by J. U. and C. G. Lloyd, in. AM. DRUGG., 1887, 141.—ED. AM. DRUGG.]

As to Lolium temulentum, the darnel, it is still undecided if this grass is poisonous at all times, or only becomes so under certain circumstances.

In regard to poisonous fungi, it is a curious circumstance that all California species that could become dangerous belong to the Agaricus group. All the fungi of this group can easily be distinguished by their possessing gills underneath their umbrella-shaped stroma or heads. It is true that not all of these fungi are poisonous, and some of our best table mushrooms belong to this order, viz., Agaricus campestris, sold in our markets and cultivated for this purpose.

The danger existing in the wild species of Agaricus is that the wholesome and the dangerous resemble each other so much that it takes the experienced eye of the collector to distinguish between them.

All the California fungi not belonging to the Agaricus order are either uninviting by smell and appearance (such as the Phallus), or are entirely harmless and wholesome food, viz., the Boletus and the much-calumniated Puffball (Lycoperdon), of which we have here a giant species.

The present essay, as I stated in the beginning of this article, is only intended to draw attention to this most important part of our flora, medicinal and pharmaceutical, and in the hope that further investigation may be made into the hidden treasures which may be revealed by a study of the poisonous plants of California.

Nux Vomica—Assay of its Pharmaceutical Preparations.*

BY H. W. SNOW, PH.C.

1. *Estimation of Strychnine and Brucine in Mixture.*

SINCE the publication of the exhaustive investigations into the botany, pharmacy, and chemistry of nux vomica by Messrs. Dunstan and Short, pharmacists have displayed considerable activity in pursuing the investigations which were thus begun, so that at the present time there is a very considerable amount of information to be found concerning the assay of this drug and its preparations. The estimation of total alkaloid in the tincture, fluid extract, and solid extract, the three prominent pharmaceutical preparations of the drug, is a matter of ease and accuracy, and no pharmacist need be deterred from undertaking their assay through mistaken ideas on this point, though it is true that an analytical balance is essential. A sufficient number of assays of the tincture and of the solid extract have been published from time to time to have pretty well settled the maximum, minimum, and average percentages of alkaloid which they contain, and thus to enable, if it is so desired, the next pharmacopœial committee to adopt alkaloidal standards for them. Assays of fluid extracts have, however, been less numerous, and the writer has collected such as have come within his notice, and added thereto some from his own experience which may thus be found serviceable.

The fluid extract may be assayed (and the tincture similarly by evaporating 25 C.c. to 10 C.c.) by diluting 5 C.c. to 50 C.c. with water, adding water of ammonia, and washing out the alkaloid with three or four successive portions of chloroform. From the mixed chloroform solutions, evaporated, if need be, to a convenient bulk, remove the alkaloid by washing with dilute sulphuric acid in two or three successive portions. From this solution again take up the alkaloid (after rendering alkaline by ammonia) with chloroform, evaporate to dryness, again dissolve in chloroform, and transfer carefully, with washing *and without filtering*, to a weighed beaker, evaporate to dryness at 100° C., and weigh the mixed alkaloids. The second solution in chloroform is made for the purpose of leaving behind the small amount of ammonium sulphate which is almost invariably transferred with the chloroform in drawing it off. Drying must be thorough, as it not infrequently happens that small amounts of chloroform are mechanically retained in the alkaloid and not easily driven off by slight heat.

The solid extract (about 1 Gm.) may be dissolved in water with the aid of a little ammonia and warming, diluted to 40 C.c., and treated the same as the fluid. Further details of assay will not here be given, but following this paper is a short bibliography on the assay of the drug and its preparations, as contributed from 1881 to date. A. B. Lyons has given us a record of six assays of fluid extracts showing a range of 0.60% to 1.6%, with an average of 1.05% of total alkaloids, and the committee on adulteration of the New York State Pharm. Assoc.† gave assays of six samples showing unusual uniformity in strength varying from 1.8% to 1.2%, with an average of 1.5%.

The following is a record of eight assays taken from my own notes, 0.58%, 0.92%, 1.35%, 1.47%, 1.98%, 2%, 2.04%, 2.54%—average 1.61%. W. Simonson has given us the results of assays of thirty-four powdered extracts, showing as low as 2.24% and as high as 18.9%, with an average of 12.8%, though the general average, excluding the unusual extremes, would show a somewhat higher percentage. A limited number of assays, made by the writer, of powdered extracts of the drug, give a slightly higher average than this, and show the powdered extract to be not greatly inferior to the pilular extract, which has been shown to average about 15% of alkaloid.

2. *Separation of Strychnine and Brucine.*

Though the estimation of the total alkaloids of nux vomica is a simple task, it is not so in the case of the separation of strychnine from brucine.

Dragendorff, after trying published methods, concluded that there was no known process for their separation on an analytical scale with satisfaction, and therefore recommended an indirect method depending on the different titration equivalents of the two alkaloids with Mayer's reagent. This reagent for an equal volume precipitates more brucine than strychnine; consequently *less* of the reagent would be required to precipitate the alkaloid, if it were all brucine, than would be required if it were all strychnine. Thus, in titrating a known weight of the alkaloid, if less reagent is required to precipitate it than would be the case with an equivalent weight of strychnine, and more is required than would be the case if it were all brucine, a mixture of the two would be inferred, and their relative quantities would be in proportion to the amount of reagent required and the titration equivalents of the two alkaloids. This process has been called into question, and the writer can bear further testimony to its worthlessness.

In the first place, the equivalents accepted were those

* Paper read before the Michigan State Pharm. Assoc., Sept., 1889.
† Drug. Circ., 1886, 178.

given by Mayer himself, and that for brucine has since been shown to be far from correct. Three or four titrations were, however, performed with a view of adopting the later and corrected equivalents of brucine in the calculation, but the results were negative and further experiment was abandoned as useless. Brucine is too fickle in its behavior with this reagent to make it at all a reliable means of assay. Dr. Lyons has proposed* to estimate the proportion of strychnine in the mixture of the alkaloids by determining the *weight* of the precipitate with Mayer's reagent from a known weight of the alkaloids. Whether this is an improvement on the volumetric method has not yet been fully determined. Dunstan and Short's recommendation for separating the alkaloids by precipitation of strychnine with ferrocyanide of potassium, under carefully prescribed conditions of acidity and dilution, was early called into question by Schweissinger,† who found that he always obtained more strychnine and less brucine than he commenced with. In a series of some eight or ten experiments performed a little over two years ago, the writer was unable to substantiate the experiments of the authors of this process. It was found that washing "until free from bitterness" was not a reliable criterion to judge by, as in the first experiments washing, though discontinued before freedom from bitterness was obtained, was excessive. The strychnine obtained was *less* in amount than was started with, but still was contaminated with brucine. Later experiments with more moderate washing yielded results too high in strychnine and too low in brucine, and the strychnine was always contaminated with brucine, as shown by the nitric acid test. It thus appears that the solubilities of the ferrocyanides of these two alkaloids, under the conditions prescribed, are too near together to make it a close means of separation. Holst and Beckurts‡ have published a volumetric modification of this assay which they claim to be preferable to the original. The authors maintain that in adding the ferrocyanide to solutions of the mixed alkaloids the strychnine is precipitated first, and the brucine only comes down when an excess of precipitant has been added. The assay is carried out by adding to a solution containing from ½% to 1% of the mixed alkaloids hydrochloric acid to distinctly acid reaction. Then run in, in small amounts at a time, a solution of ferrocyanide of potassium of known strength until a filtered drop of the fluid produces a stain on paper impregnated with ferric chloride. From these data calculate the strychnine. This process seems well worthy of attention, but the writer has not yet had opportunity to verify it and has seen no further reports on it. Schweissinger§ has recommended an indirect method for the estimation of the alkaloids by titrating a known weight of them with standard acid and alkali, using litmus as an indicator. This process seems to be well thought of, and in use by some chemists; but it is difficult to get an indicator which is sufficiently sensitive, cochineal, litmus, and methyl orange having been tried with little success. Separation with absolute alcohol was tried but abandoned by Dragendorff‖ as an analytical process, and it was also the experience of Dr. A. B. Prescott,¶ with alcohol of spec. grav. 0.941 (39.3% abs. alcohol by weight), that the separation was not sufficiently close for analytical purposes. With alcohol of spec. grav. 0.970 (21.31% abs. alcohol by weight) he found 2,617½ parts necessary to dissolve 1 part of strychnine and 37.3 parts to dissolve 1 part of brucine. This degree of concentration he recommends, and doubtless it is one of the best yet offered. In this connection the writer wishes to record a series of negative experiments on the estimation, volumetrically, of the chlorine contained in the chlorides from a known weight of the alkaloids, making this the basis of an indirect determination of them. They were dissolved in a little chloroform, and chloroformic solution of hydrochloric acid was added until slightly acid. The solution was then evaporated repeatedly with fresh chloroform and alcohol in order to free the alkaloids from mechanically adhering acid. The chlorides, when dissolved in water, were titrated with silver nitrate ($\frac{n}{100}$), using potassic normal chromate as an indicator. The reaction seems to be progressive, and, with the dilute standard solutions required, it was not possible to arrive at the end reaction with a sufficient exactness to enable calculations approaching the truth to be made. Repetition of these experiments at a later period confirmed the first opinions. It was again tried, using Volhard's sulphocyanide method of estimating the chlorine. This is carried out by adding an excess of silver nitrate solution, shaking vigorously, and, after adding a few drops of ammonio-ferric alum as an indicator, titrating back with ammonium sulphocyanide; but results were no better. The molecular weights of the two alkaloids are close together, being respectively for strychnine and brucine 334 and 394, with a difference of only 60; and 9.151 parts of strychnine will combine with 1 part of hydrochloric acid, while 10.794 parts of brucine will combine with the same amount. The difference between them is therefore slight, and, as the alkaloids are usually presented, under the conditions of assay, in small amounts, this necessitates any indirect process to be of great accuracy and precision in order to be of any value. Volumetric methods require very dilute standard solutions and indicators, and these latter seem to be difficult to obtain of sufficient sensitiveness, especially in the acidimetric determinations.

Dunstan and Short: Nux Vomica, drug, Pharm. Jour. and Trans., [3] xiii., 665; [3] xv., 156 [Year Book, 1883, 233; AMER. DRUG., 1883, 124]. Nux Vomica, extract, Pharm. Jour. and Trans., [3] xiii., 443 [Year Book, 1883, 475; 1884, 273; Amer. Jour. Pharm., 1883, 268]. Nux Vomica, tincture, Pharm. Jour. and Trans., [3] xiv., 292; [3] xiv., 441 [Year Book, 1883, 476; AMER. DRUG., 1884, p. 5]. Nux Vomica, standard extract, Pharm. Jour. and Trans., [3] xiv., 621 [Year Book, 1884, 274; Drug. Circ., 1884, 52]. Nux Vomica, standard tincture, Pharm. Jour. and Trans., [3] xiv., 622 [Year Book, 1884, 273; Drug. Circ., 1884, 52].

Lyons, A. B.: Nux Vomica, extract, tincture, etc., Proc. Mich. S. P. As., 1885, 172 [Drug. Circ., 1885, 253]. Nux Vomica, drug assay, Drug. Circ., 1886, 137.

Conroy, M.: Nux Vomica, tincture, Pharm. Jour. and Trans., [3] xiv., 461.

Dieterich, E.: Nux Vomica, extract assay, Amer. Jour. Phar., 1887, 179; Year Book, 1887, 244. (From Pharm. Centralhalle.)

Schact, G. F.: Mayer's reagent for estimation of total alkaloids in tinctures, etc., Year Book, 1884, 275. (See also Lyons, A. B., and Drug. Circ., 1886, 137; Snow, H. W., Proc. Mich. S. P. A., 1888, 114, for titration equivalents of mixed alkaloids.)

Simonson, W.: Nux Vomica, powdered extract, Pharm. Era, 1888, 277; AMER. DRUG., 1888, 122.

Yerger, E. J.: Nux Vomica, tincture, U. S., Amer. Jour. Phar., 1886, 291.

Passolt, H. A.: Nux Vomica, tincture, U. S., Proc. Mich. State Phar. Assoc., 1888, 101.

[Gerock's method of separating strychnine and brucine by means of nitric acid probably came to the author's notice too late. It would appear, from the discoverer's analytical data, that it is the best so far known. See AM. DRUGG., 1889, 91 (May).—ED. AM. DRUGG.]

Active Constituents of Rhamnus Purshiana.*

BY AUG. C. ZEIG, PH.C.

RHAMNUS PURSHIANA is a native of California, or, more properly speaking, of the Pacific slope. Its name was given in honor of Frederick Pursh, the renowned Prussian botanist, who in 1814 gave a full description which fixed its place in botany, his investigation having been made upon specimens obtained directly from the habitat.

This drug was first brought to notice by Dr. Bundy, and was called Cascara sagrada by the early Mexican settlers in California, the term meaning holy bark. It is now principally known in the Western States as chittem bark.

A good deal has been said of late in various journals of pharmacy concerning this drug, as well as some of its galenical preparations. The high price which it has commanded in the drug market the past year induced a great rush in gathering the same, and has had a great tendency to bring on the market a drug much inferior in quality, by having been gathered out of season; and again it has had a tendency to bring on the market a substitute or adulterant (a species of alder, as F. A. Beckett says), which, although quite similar to cascara in appearance and taste, is of no value whatever as an aperient, for it does not contain the active constituents present in Cascara sagrada.

As to the chemical constituents of Rhamnus Purshiana, I shall call attention to what investigators have contributed to our knowledge through their reports in the various journals of pharmacy. Prof. A. B. Prescott gives in the *American Journal of Pharmacy* for 1879. (see list of references at the close of the article) the result of his investigations, both microscopic and otherwise, among which he reports the presence of three resins—a brown, a yellow, and a red resin—a crystallizable body, three vegetable acids, as tannic, oxalic, and malic acid, both a fat and a volatile oil, wax, and starch. In addition to this, Prof. Wenzell states in the *Pharmaceutical Journal* of 1886 that he has obtained a substance which he describes as being of a deep orange-red color, namely, a glucoside. Messrs. Meier and Webber report in the *American Journal of Pharmacy* of last year, as a result of their investigation, the presence of a vegetable ferment, glucose and traces of ammonia, while Dr. Eccles reports in *Druggists' Circular* for 1888 having discovered the presence of an alkaloid which he states he has separated from the fluid extract and precipitated with Mayer's reagent.

Its extensive use in practice, especially in the form of the fluid extract, has amply confirmed the fact that the drug possesses decided laxative properties. Furthermore, it is set forth by some and denied by others that it also possesses tonic properties. To which of these constituents just enumerated could the laxative and tonic powers of cascara be due?

Messrs. Parke, Davis & Co. were kind enough to send me a sample of the drug, and I undertook to estimate the quantity of the different resins present, and by physiological experiment ascertain as to which is the most active. Furthermore, I undertook to make out a working formula for obtaining the resin in a concentrated form.

* Paper read at the meeting of the American Pharmaceutical Association at San Francisco.

* Drug. Circ., 1886, 137.
† Ph. Jour. and Trans., [3] xvi., 447; AMER. DRUG., 1885, 230, both from Archiv der Pharm., [3], xii., 529, 609.
‡ Drug. Circ., 1887, 104, from Pharm. Centralhalle.
§ Where last cited.
‖ "Plant Analysis," Eng. ed., 1884, p. 191.
¶ Proc. Amer. Phar. Assoc., 1878, 806.

The method suggested by Mr. Wise, in *Western Druggist*, was first employed for the separation of the three resins. A fluid extract was prepared, using strong alcohol as a menstruum. To this fluid extract was added an equal volume of ether, the mixture agitated and allowed to stand for twenty-four hours.

The ethereal liquid was then decanted and strained, the precipitate washed, dried, and weighed. The product consisted of a red resin, soluble in alcohol and insoluble in ether. The amount of this resin obtained from 114 Gm. of drug was 6.15 Gm., which by physiological experiment appeared to be quite inert.

The ethereal liquid was next evaporated to a somewhat syrupy consistence, seventy per cent alcohol was added, and the whole allowed to stand for some time. The alcoholic solution was then strained and the precipitate washed and dried. This precipitate consisted of a yellowish-brown resin, odorless, but having a slightly bitter taste. The quantity obtained from 114 Gm. of drug was 1.23 Gm. By physiological experiment this portion showed itself quite inert.

The strained alcoholic solution obtained as stated in last paragraph was then evaporated to a dry syrupy consistence, and slowly decanted into water acidulated with hydrochloric acid. The liquid was now strained, the precipitate washed and dried. This consisted of a third resin, of a dark brown color, giving an intense purple with potassium hydrate, having a somewhat bitter taste, and an odor much like the odor of the drug. Physiological experiment showed that it is the most active resin of the drug.

The next thing in view was to obtain some cheap and practical formula for obtaining this resin in a concentrated form. The method suggested by Mr. Wise for separating the resins is open to but one special objection, namely, that of being too expensive a method, as it employs the use of a large quantity of ether as a precipitant. Various other precipitants were tried instead of ether, but without success. Finally I found that by using dilute alcohol as a menstruum in percolating the drug, very little of the inert resin is dissolved, and the use of ether as a precipitant may be avoided. As a formula for obtaining the active resin, I would recommend the following:

Rhamnus Purshiana	8 oz.
Dilute Alcohol,	
Water	each q. s.
Hydrochloric Acid	2 fl. dr.

Moisten the powder with 8 fl. oz. dilute alcohol, pack it firmly in a cylindrical percolator, and add enough dilute alcohol to saturate the powder and leave a stratum above it. When the liquid begins to drop from the percolator, close the lower orifice, and, having closely covered the percolator, macerate for twenty-four hours. Then allow the percolation to proceed, gradually adding dilute alcohol until 12 fl. oz. of percolate are obtained, or until it produces but a slight turbidity when dropped into acidulated water. Evaporate off the dilute alcohol upon a water-bath until the percolate is reduced to a syrupy consistence, and pour it slowly with constant stirring into 8 fl. oz. of water containing the hydrochloric acid. Let stand until the precipitate has subsided, then decant the supernatant liquid and wash the precipitate three times by decantation with fresh portions of cold water. Spread it on a strainer, and, having pressed out the liquid, dry the resin by exposure to air at a gentle heat. This resin dissolves in potassium hydrate, giving an intense purple color, which disappears upon acidulating with hydrochloric acid, when the resin is again precipitated, and may in this manner be obtained devoid of bitterness. Five grains of this resin, a bitter resin, had a marked laxative effect upon an adult.

Now, as to the glucoside mentioned—which, according to Messrs. Meier and Webber, seems to be peculiar to Rhamnus Purshiana, as these authors were unable to determine its presence in Rhamnus Frangula as found in the market—it may be regarded as one of the important constituents of the drug, and the source of an intensely bitter principle (Meier and Webber), to which, no doubt, the tonic property is due. It may, according to the above authors, be obtained in quite a pure state for examination by making an aqueous percolate of the drug and precipitating with a solution of subacetate of lead. The excess of lead may be removed by passing hydrogen sulphide into the solution, precipitating the lead as a sulphide, and filtering. This filtrate shows decided chemical change when boiled with sulphuric or hydrochloric acid, giving off a peculiar odor. When examined with the aid of a microscope, there is visible an oily and resinous substance with small crystals distributed through it. This resinous substance appears to be soluble in alcohol or potassium hydrate, and insoluble in water. With potassium hydrate it turns a reddish brown. As the glucoside is capable of decomposition when treated with acids in a test tube, it would likewise be capable of decomposition in the gastric juice of the stomach (Meier and Webber), which contains two-tenths of one per cent of hydrochloric acid.

The resins, as has been stated before, may be obtained devoid of bitterness, while the glucoside is in itself not bitter (Meier and Webber), but is the source of the bitter principle when treated with acids; therefore it appears possible that there may be made a preparation of Cascara sagrada quite tasteless, yet containing all the active constituents to which both its laxative and tonic properties are due.

[The following is a list of references on the constituents of Rhamnus Purshiana (Cascara sagrada):

Prescott, 1879: New Preparations, Detroit, 3, 27; Am. Jour. Phar., 51, 165; Archiv der Phar., [3] 15, 547.
Wenzell, 1886: Phar. Rundschau, 4, 79; Proc. Am. Phar. Assoc., 34, 462.
Limousin, 1886: Phar. Jour. Trans., [3] 15, 615.
Wise, H., 1885: Western Druggist, 7, 125.
Eccles, R. G., 1888: Druggists' Circular, page 54, March; Proc. Am. Phar. Assoc., 36, 402.
Schwabe, P., 1888: Archiv der Phar.
Meier and Webber, 1888: Am. Jour. Phar., 60, 87; Proc. Am. Phar. Assoc., 36, 400.
Fuge, H. D., 1889: Phar. Jour. Trans., [3] 18, 736 (galenicals).]

Medicinal Plants of the Argentine Republic.

THE crude drugs recently exhibited in Paris by the Argentine Republic attracted attention not only by their great variety but also on account of the excellent manner in which they were presented. A correspondent of the *British and Colonial Druggist* gives the following account of a portion of them:

Relbunicum hirtum (Schumacher), of the family Rubiaceæ, called by the natives "Cangai"; an herb used against acute rheumatism. Found in abundance.

Equisetum species, family Equisetaceæ, of which the native name is "Cola de Caballo"; a diuretic and astringent plant, used in cases of gonorrhœa and diarrhœa. Very scarce.

Petiveria alliacea, of the family Phytolaccaceæ, native name "Guinè ò Pipi"; a plant of which the root is used as a febrifuge, and against rheumatism, hydrophobia, snake-bites, etc. Rather common.

Stachytarpha dichotoma, of the family Verbenaceæ, named by the natives "Yerbon o Menstruz"; a common plant, used as a tonic, and in bronchitis, coughs, convulsions, colic, paralysis, contusions, etc.

Peperomia species, of the genus Piperaceæ, the common name of which is "Yatebû-caá"; a febrifuge and a tonic. Found in abundance.

Scirpus capillaris, of the order Cyperaceæ, native name "Espartillo"; recommended for pulmonary affections. Found very frequently.

Calopagonium cæruleum, of the order Leguminosæ, by the natives called "Cumanda viray"; an abundant herb, employed as an aperient febrifuge.

Hyptis species, belonging to the order Labiatæ, known amongst the common people as "Ovechá-caá"; found rather frequently, and used in the treatment of syphilis.

Begonia cuculata, a member of the family Begoniaceæ, known amongst the inhabitants as "Agrial"; possessing antiscorbutic diuretic, and antiphlogistic properties, and employed against catarrhal affections, and against inflammation and irritation of the urinary passages. Often met with.

Tagetes glandulifera (Schrk), of the order Synantheræ, the native name of which is "Zuico" or "Chinchilla"; a scarce herb, with tonic qualities.

Cuphea species, belonging to the family Lytharieæ, called in the country "Icipo-peré"; a common herb, used as a purgative, diuretic, and a purifier of the blood.

Rhynchosia diversifolia (Mich.), a member of the order Leguminosæ, the vulgar denomination of which is "Urizúheé"; an expectorant, and a remedy for spasmodic coughs.

Cuscuta species, of the family Convolvulaceæ, by the natives named "Cabello de Angel," or "Icipo Chumbo"; a parasitical plant, with gently laxative, diuretic, and antiphlogistic properties, used in the form of an infusion for intermittent fevers, congestion of the respiratory organs, and in the shape of a tea in cases of hæmoptysis, inflammation of the throat, and internal abscesses. It is not very common.

Chenopodium anthelminticum, of the family Chenopodiaceæ, called by the natives "Yerba de Santa Maria," or "Caané"; an herb of which an infusion in the shape of a tea has digestive, slightly stimulating, and diaphoretic properties. It is also used as a remedy for hysterical fits, indigestion, catarrh of the stomach, dysentery, pleurisy, asthma, and especially for paralysis of the tongue.

Ocotea (*Strychnodaphne*) *suaveolens*, one of the Laurieæ, in the vernacular "Laurel blanco," or "Canela molle"; a tree of which the leaves are recommended for their diuretic and carminative properties, and are also used as an emmenagogue.

Acanthospermum xanthioides, a member of the tribe of Synantheræ, vernacular name of which is "Aganabicho"; a common antisyphilitic herb, also prescribed for gonorrhœa. The root is an intense narcotic.

Baccharis articulata, of the family Synantheræ, the common appellation of which is "Carqueja"; an herb found abundantly, and useful against indigestion, sterility, etc.

Crotolaria incana, belonging to the order "Leguminosæ," and called by the natives "Yerba de Toro"; a com-

mon tonic herb, makes an excellent tea, is very aromatic, much used for stomach-ache, and produces a rich perfume.

Senecio albicaulis, of the family Synantherеæ, known in the country as "Yerba Mercurial"; an herb little met with, possessing qualities of a purifying, diaphoretic, antifebrile, and pectoral nature.

Discaria longispina (Miers), one of the species Rhamneæ, of which the native name is "Quina del Campo"; a scarce bush covered with spines, of which the roots have antifebrile properties.

Anchieta salutaris, a plant of the family Violaceæ, called amongst the people "Cipo-zumo," and frequently found; has various purgative and antisyphilitic virtues.

Echites longiflora, of the genus Apocinæ, in the common tongue "Yalapa"; a plant used as a purgative, and in a powdered condition employed in plasters. Also made into an infusion.

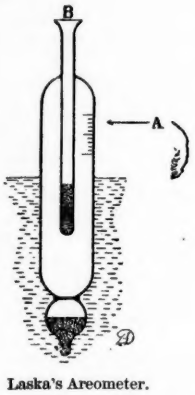
Julocroton Montevidensis (Klotz), classed among the Euphorbiaceæ, and called by the natives "Velamen"; is a somewhat rare herb, prescribed in cases of syphilis and syphilitic rheumatism.

FLAT-BOTTOMED FILTERING APPARATUS.

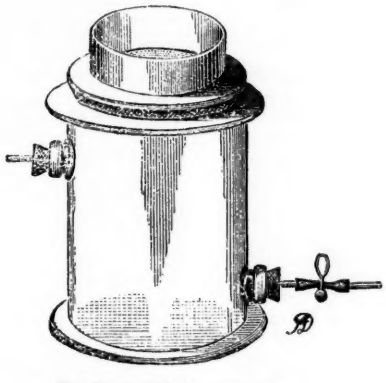
THE form of filtering apparatus shown in the accompanying illustration and devised by Dr. Buechner is very serviceable, particularly for mixtures which ordinarily clog filtering paper in a short time. Moreover, the apparatus facilitates the rapid washing of any precipitate. The flat-bottomed glass dish on top, which has a sieve-like bottom, fits hermetically into the receptacle, which may be connected with the filter pump by means of the upper lateral connection.

APPARATUS FOR DELIVERING QUICKSILVER IN DROPS.

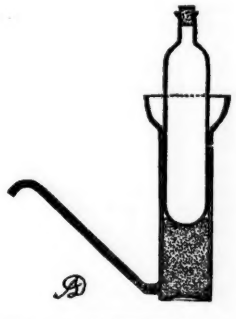
THE adjoining figure illustrates an apparatus suggested by F. Heerwagen for delivering mercury in drops, and requires but little description. The closed flask might be replaced by a small test tube, and the outer vessel by a test tube of larger calibre, to the bottom of which a small delivery tube of glass has been attached. The enlarged upper extremity of the outer vessel is calculated to avoid



Laska's Areometer.



Buechner's Filtering Apparatus.



Heerwagen's Mercury-Dropper.

ON A NEW AREOMETER.

IT is well known that areometers cannot show the specific gravity of a liquid with great accuracy, owing to the capillarity of liquids, which renders it generally impossible to recognize the exact mark corresponding to the level of the liquid, which is usually concave. This defect has now been overcome by a device proposed by Dr. W. Laska, of Prague, which is as simple as it is ingenious.

The new areometer consists of an external body of the usual shape, into the upper part of which is fused an open tube, B. Upon the outside of the body of the areometer is engraved a scale in millimeters. When the specific gravity of a liquid is to be determined, the areometer is immersed, the liquid being at a definite temperature, and the millimeter mark corresponding to a fixed index, A, attached outside of the tube, exactly noted. Next an exactly weighed quantity of mercury is poured into the inner tube, and the new position of the areometer read off in the same way.

The calculation depends upon the value of one division of the millimeter scale as compared with the weight of mercury.

This is easily determined, once for all, by immersing the areometer in pure water at 15° C. (or at any other degree for which the instrument is to be used), and then ascertaining how many divisions it will be immersed by the addition of a known weight of mercury.

When the areometer is used for other liquids, the specific gravity is found by dividing the difference of immersion (before and after the addition of mercury) in millimeters with the weight of the mercury in milligrammes.

Before using the areometer for another operation, it must be rendered scrupulously clean.—*Zeitschr. f. Instrum.*, 1889, 176.

Synthesis of Active Coniine.

SCHORLEMMER, in his "Rise and Development of Organic Chemistry," has stated that the complete synthesis of active coniine has not yet been accomplished, but the author has previously shown that the alkaloid in question can be obtained from its elements.

Acetic acid can be prepared synthetically, and from it acetone, isopropyl alcohol, and glycerin can be successively obtained. Glycerin can be converted into bromallyl, and then into trimethylene bromide, and from the latter piperidine and finally pyridine can be produced. A picoline can be obtained from pyridine (Ladenburg and Lange, *Ann.*, 247, 5), and can be converted into coniine (Ladenburg, *Ann.*, 247, 80).

The dextro-tartaric acid which is necessary to the production of the active base can also be prepared from its elements.—A. LADENBURG in *Berichte*, 22, 1403 (and *J. Soc. Chem. Ind.*)

any overflow of mercury caused by carelessness in applying force to the plunger, but is not an essential feature.—*Chem. Centralblatt.*

Eikonogen—A New Universal Developer for Photographic Dry Plates and Bromide Paper.

ADVANCES in photography are now so rapid that it is somewhat confusing to the professional or amateur photographer as to when and where the improvements will stop—if they ever do. Simply the subject of developers for dry plates would compose a volume if all the formulas, with their variations, were published, including, as it would, the experience and whims of hundreds of photographers. Scientists in chemistry have been experimenting upon the remarkable reducing power on the silver salts observed in the derivatives of aniline, and have endeavored to make them of practical use in photography.

Such a derivative was discovered early in this year by Dr. Anderson, of Berlin, Germany, and is named "eikonogen." It is manufactured there by very extensive aniline dye works, and promises to supplant all other developing agents yet proposed.

It is a substitute for pyrogallol, hydroquinone, oxalate of potash, and sulphate of iron, and, in fact, of all chemicals that reduce the silver salts. As it can be so easily made, it becomes at once the cheapest reducing chemical now on the market, and we have no doubt, as the demand increases, the price will still be lower. It is packed in small tin cans similar to those holding aniline dyes, having a hinged spout at one corner.

It will keep indefinitely in a dry powder in any climate, provided it is not injured by the fumes of ammonia, with which it must not come in contact. It is in the form of a greenish-white powder, which, when dissolved in water, turns to a dark green color, but is perfectly clear.

The advantages claimed for it, and which we have found to be substantially true by experiment, are that it produces a bluish-black colored image, depositing in the film a very delicate precipitate, which, in consequence, brings out the finest details to a degree that is surprising. The structure of the picture film is, therefore, much more compact and finer grained than it is possible to obtain with the pyro or ferrous oxalate developer. The developer operates regardless of the temperature. Hence it is adapted for use in hot or cold climates. It is non poisonous, perfectly harmless, does not stain the fingers, does not discolor or deteriorate when exposed to the air in a tray or graduate, always keeps clear, will keep mixed in a well-stoppered bottle ready for use for over a month, and acts so quickly and powerfully that the ordinary exposures given for pyro development may, it is said, be reduced one half. But its pre-eminent quality, in addition to its great reducing power, is that it does not stain the film in the least, even after repeated use, and hence a given quantity of solution

may be used over and over again until its developing power ceases.

The stainless nature of the developer adapts it admirably for the production of line work negatives on dry plates, for the development of lantern slides, and for positive prints on gelatino-bromide paper or porcelain. So satisfactory is the working on paper that we have substituted it for the ferrous oxalate developer. Its particular merit is that every copy on paper is beautifully clear in the high lights, which is a point of great importance in making bromide enlargements.

For shortly exposed plates and bromide paper the following formula for a one-solution developer works well:

Sulphite of Sodium c. p.	2 oz.
Carbonate of Potassium	1 "
Distilled, Melted Ice, or Rain Water	30 "
Eikonogen	1 "

Dissolve in the order named. Eikonogen is perhaps ten times less soluble than pyro. We tried to dissolve the ounce in 10 and 20 ounces of distilled water, but without success. In using this developer, it is advised that from 6 to 8 drops of the following accelerating solution be added:

Hyposulphite of Sodium	60 gr.
Bromide of Sodium	360 "
Water	8 oz.

We simply added 3 or 4 grains of bromide of potassium to 5 ounces of the developer and obtained good results.

It is not necessary to mix the carbonate of potash to form one solution. It may be kept separate and dissolved in concentrated form in the proportion of 160 grains to the ounce of water. Taking 5 ounces of the sulphite and eikonogen solution, and adding thereto from ½ to ¼ drachm of the potash solution as a developer, will bring out an ordinarily well-exposed plate as rapidly as if a strong pyro and potash solution were employed. After the image is well out and there are some details in the shadows that do not appear, it is only necessary to add a drachm of the potash solution to the developer to easily bring them out. There is no fogging of the film whatever by the developer. Hence, though the image may appear suddenly and be well developed within a minute after the developer is applied, one need not fear to leave it on long enough to acquire sufficient density. If the developer operates too fast, it may be improved by diluting with water and adding a few grains of bromide of potassium. Or the developer may be poured off and a weak bromide of potassium solution be poured on. A developer for lantern slides need not be as strong in eikonogen as for negatives. We recommend the following proportions:

Sulphite of Sodium c. p	10 gr.
Carbonate of Potassium	2 "
Eikonogen	5 "
Water (Distilled or Rain Water)	1 oz.

The above may be used as one solution, and will develop a number of lantern slides. As soon as it begins to work slow, 2 or 3 grains of carbonate of potash added will accelerate it. The high lights will be absolutely clear, while the black portions will not be too dense for the lantern. The tone is bluish black.

Eikonogen and Soda Developer.

A.

Sodium Sulphite (crystals, c. p.)	4 oz.
Distilled Water	60 "
Eikonogen	2 "

B.

Sodium Carbonate (crystals)	3 oz.
Distilled Water	20 "

Dissolve in order named. A developer is made by adding to 3 ounces of A, 1 ounce of B.

Single Solution, Eikonogen and Soda Developer.

Sodium Sulphite (crystals, c. p.)	4 oz.
Sodium Carbonate	3 "
Distilled Water	80 "
Eikonogen	1 "

Dissolve in the order named. Add a few drops of the hypo-solution during development. All of the formulæ are based on 437½ grains to the ounce.

The usual alum and fixing baths may be employed.

We notice that the developer permeates the film more evenly and rapidly than with pyro, and acts with an energy which is astonishing. For under-exposed or instantaneously exposed plates it is especially adapted, and will make the production of such pictures a pleasure.

We have developed in seven ounces of solution twelve 10 by 12 plates in succession without replenishing it. After four plates have been developed, the solution should be filtered to eliminate the floating particles of gelatin that become detached during development. The color becomes yellow when it is exhausted. It is probably unnecessary to rock the tray. We are glad to know that eikonogen is to be supplied to the trade here in large quantities. As a universal developer for dry plates, it stands at the head.—*Sci. Amer.*

Notes on Strophanthus.

At the recent British Pharm. Conference, Mr. Thomas Christy presented a paper on "Strophanthus Plants," in the course of which the author referred to the want of uniformity which exists in the strophanthus seeds as they come into commerce. Even seeds from the same source, when germinated, yield plants which are often different amongst themselves. After the paper was read fresh specimens of the plants grown in his greenhouse were shown, to illustrate this assertion, and amongst a dozen or so we did not observe two which could be said to be identical. But it would be useless to attempt to give here without engravings that part of Mr. Christy's paper in which he referred to the plants. It will suffice to give the report made to him by Professor Husemann, of Göttingen, on a comparative analysis between tinctures of the seeds known in commerce as "Kombé," "Hispidus," "Minor," and "Niger." Professor Husemann says:

Both seeds of *Strophanthus niger* belong to the series of cardiac drugs. "In their action upon the heart they are hardly to be distinguished from the African species of strophanthus, commonly known as 'Kombé.' I made experiments with the alcoholic extract after eliminating fatty matters with ether. The minor variety yielded 10 per cent, and hispidus about 12½ per cent of extract. The latter, by reason of a large percentage of chlorophyll, is greener than the former, which is of a dark brown color. Of both extracts, 1 Cg. stopped the heart's action in a frog within a few minutes; no special direct action was noticeable upon the veins, showing in this respect that the two extracts above mentioned do not differ in any way from that obtained from the Kombé; and, furthermore, no 'narcotic' action was found."

Mr. Christy then proceeded to describe inquiries which had been made by Dr. Blondel under his direction, and which resulted in the discovery that what they had taken for *S. Kombé* was really only a variety of *S. hispidus*, or the mother species, as Mr. Christy pertinently called it. Another species of the plant, known as "glabrus of Gaboon," was next referred to. It is noteworthy, in connection with this specimen, that it is the same kind as Hardy, Gallois, and Polaillon used in their experiments, during which they discovered a crystallizable alkaloid.

We also understood from Mr. Christy's remarks that this is the seed which Continental chemists use in the manufacture of crystallized strophanthin. He showed one of the plants propagated from the seed. It has leaves somewhat similar to the Kombé species. Proceeding, he spoke of some suspicious seeds that he had met with, and concluded by saying that at the Paris Therapeutical Congress Dr. Dujardin-Beaumetz clearly put forward as the result of his experiments with the tincture of strophanthus, that he obtained an entirely different action when he employed strophanthin, and he strongly advised medical men to keep to the tincture, as giving the best results.

At the same conference another paper, relating to the "Chemistry of Strophanthus," was presented by Dr. T. R. Fraser. This paper was of great length. The author first spoke of the seeds, and gave a proximate analysis of them, which was as follows:

	Per cent.
Water	6.7
Petroleum Ether Extract (chiefly fat)	31.81
Ethyl Ether Extract (Resin, Chlorophyll, etc.)	0.845
Alcohol Extract (20 sps. to 1 of seeds)	8.94
Water Extract, Mucilage	7.35
Water Extract, Albumen	1.95
Ash	3.514
	61.109
Undetermined	38 891
	100.000

A careful examination was made of the extracts obtained by means of the ethers, and after purification they were reduced to a pale greenish-yellow oil having a spec. grav. of 0.975; but this factor varied somewhat, a pale-green oil from other seeds being 0.954, and a dark greenish-brown one 0.9267. The alcohol extract was next described. It was found to consist of

	Per cent.
Impure Strophanthin	63.367
Mucilage	16.275
Resin	14.542
	94.184

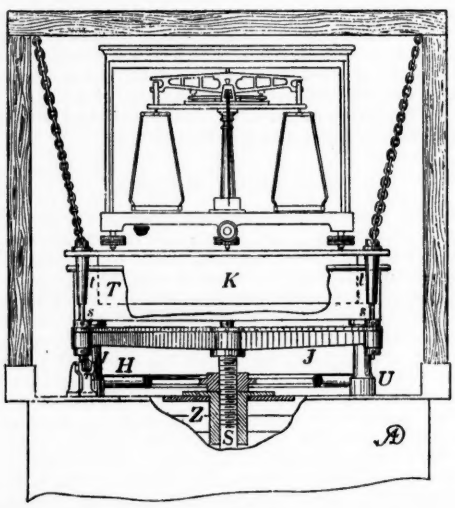
Following this an analysis of the separated testa and cotyledons of the seeds was given, and this showed that the testa yields most of the coloring matters, and the cotyledons and embryos most of the strophanthin and oil. Having described the reactions of the alcoholic extract, the author proceeded to show that it does not contain an alkaloid, but he conclusively demonstrated the presence of a glucoside—strophanthin—and gave the following as his method for the preparation of that body:

The active principle was precipitated by a solution of tannin from a strong solution of the alcoholic extract in water; the well-washed tannate was thoroughly mixed with recently precipitated, carefully washed, and moist oxide of lead, which was added in the quantity calculated

to be necessary for the conversion of the tannin into tannate of lead; the mixture was digested for several days at a low temperature, and after it had been dried it was thoroughly exhausted with rectified spirit and occasionally with proof spirit. If the alcoholic solution still contained any tannin, as it usually did, it was evaporated to a syrupy consistence, and again treated as above with a smaller quantity of oxide of lead. It was frequently necessary to adopt a third such treatment before every trace of tannin had been removed. The product was now dissolved in weak alcohol, and, if necessary, decanted and filtered from sediment; and through the clear and usually almost colorless solution a gentle stream of well-washed carbonic acid was passed for two or three days, in order to remove traces of lead. The solution was then evaporated to dryness and the residue dissolved in rectified spirit, and after filtration ether was added to the solution to precipitate the active principle. The precipitate was dissolved in absolute alcohol, which usually left a further slight sediment, and the clear alcoholic solution was finally dried by spontaneous evaporation and by being placed in a partial vacuum over sulphuric acid.

By this process about 65 per cent of the active principle, strophanthin, was usually obtained from the extract. This quantity, undoubtedly, does not represent the whole of the active principle present in the extract; but the result otherwise is satisfactory in so far as the quality of the product is concerned.

The strophanthin obtained is a colorless, opaque, and brittle substance, which is not crystalline to the naked eye, but is found to be so under the microscope. It is soluble in 55 parts of alcohol spec. grav. 0.796, and insoluble in ether and chloroform. An analysis of the pure body showed its composition to be represented by the formula $C_{16}H_{26}O_8$. It gives a bright green color with sulphuric acid, with 10 per cent nitric acid at 115°–130° F. a bright violet color with blue streaks, and with other reagents colorations which are more or less indistinctive.—After *Chem. and Drugg.*



AVOIDING VIBRATION IN FINE BALANCES.

One of the most annoying features connected with the use of fine balances in buildings situated along lines of heavy traffic is the vibration when the arrest of beam and pans is released. This often makes it impossible to read off the index, and, moreover, gradually reduces the delicacy of the instrument.

To do away with this drawback, W. Marck, of the imperial bureau of weights and measures at Vienna, devised a new method, consisting partly in a suspension of the balance from above, and partly by floating the balance case in a tank of glycerin. The suspension is effected by four obliquely acting chains, the strain upon each of which is very small when the balance case floats, and is, moreover, as uniform as possible. When the balance is out of use, or in the intervals of the several weighings, during which the case must be opened, weights and load removed or altered—which could not well be done while the case is freely floating—the whole case is slightly raised by a horizontal wheel, H, acting upon the screw piston, S. As soon as the weights are rearranged and the scale is closed again, a turn of the wheel will cause the case to sink far enough to float again.

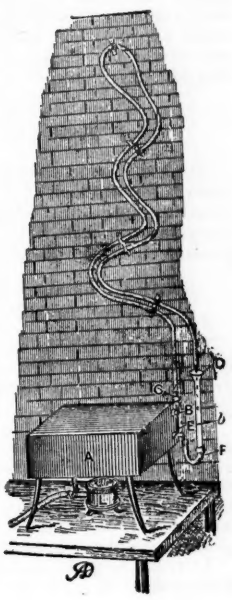
With this arrangement the author has completely neutralized the vibratory disturbance caused by passing wagons and the like.

He adds that this new method has also some disadvantages, viz., the greater care and time required in using the balance, and "the alteration in the composition of the air due to the vapors arising out of the glycerin bath."—*Zeitschr. f. Instrum.*, 1889, 175.

[*Note by Ed. Am. Drugg.*—We think the author is mistaken regarding those "vapors." Certainly no glycerin is volatilized from such a bath. The only possible source of contamination which we can imagine is that the glycerin will naturally abstract more or less water from the air in the course of time, and that, when the surrounding air is comparatively dry, it will take up some aqueous vapor from the bath. It appears to us that it might have been preferable to select another liquid, though, if it is much lighter than glycerin, the immersed part of the balance case will have to be deeper. A fine grade of paraffin oil or liquid albolene may possibly answer.]

A CONSTANT WATER-BATH.

A description of this apparatus will be found in the *Pharmaceutische Rundschau* for March, 1887, and in the Proceedings of the American Pharmaceutical Association for 1887. It has proven so satisfactory that I think it worth while to repeat the description here for the information of chemists. I have kept my bath boiling day and night seven days in the week, and have added water to it but five times in as many years.



It consists of the square box A, supported over a Fletcher's solid-flame burner. The top of the box, 15 × 15.5 inches, is formed by a brass plate ⅛ inch thick, which thus is stiff enough to support a considerable weight without yielding, the sides and bottom being sheet copper. From the point B projects a ½-inch brass tube, B C, which turns up at a right angle. At E is a stop-cock, which is connected, by a thick rubber tube, with the glass tube D F, which is fastened against the adjoining wall. Connected with C by a rubber joint is a ½-inch block-tin tube of 20 feet length, which extends up the wall, in the manner shown, to the highest point, and thence returns and ends just over the slightly funnel-shaped top of the glass tube at D. The bath, being filled with water to just the level, B *b*, may be kept constant by boiling for many days without appreciable loss of water, the steam being condensed in its passage up, or—if uncondensed before it reaches the point—in its passage down the block-tin tube. In flat-bottom platinum or porcelain capsules, evaporation goes on very rapidly when placed on top of this water-bath. The whole surface of the bath is nickel-plated.—Dr. Bennett F. Davenport, in *Journ. Anal. Chem.*, iii., 269.

The Nature of Solutions.

I beg to announce that I have this day succeeded in isolating in the solid crystalline form one of the hydrates of sulphuric acid, the existence of which in solutions I had lately predicted from a study of the densities and heat of dissolution of sulphuric-acid solutions of different strengths. The new hydrate is $H_2SO_4 4H_2O$, containing 57.66 per cent of acid. The proof of its existence depends on its having a definite melting point at —25°, which is lowered (as far as about —70°) by the addition of excess of either water or sulphuric acid, and on other evidence which it is not convenient to give in the present place. The isolation of one of the hydrates with either 2, 4, 5, or 9 H_2O had been rendered probable by a study of the freezing points of sulphuric-acid solutions, and the nature of the curves representing the freezing points of solutions from which the tetrahydrate crystallizes renders it highly improbable that any other hydrate will be obtained in the solid form, except, of course, the monohydrate, which has long been known. Such an absolute proof of the conclusions which I have drawn from other sources must place those conclusions beyond doubt, and must establish as an incontestable fact the existence of hydrates in solution.—S. U. Pickering, in *Chem. News.*

Phenyl-Urethane.

This new compound, produced by the union of urethane and phenyl (C_6H_5), has been recommended by Giacomini, of Turin, as a new antipyretic, antirheumatic, and analgesic. It is administered in doses of about 8 grains. It is reported to be a most efficient agent in allaying the pain and reducing the swelling both in acute and in chronic articular rheumatism. As a general analgesic it has not always been as successful. The substance is in form of a white, crystalline powder, insoluble in water, but soluble in alcohol. It is best administered dissolved in wine.—*Rundschau* (Prag.).

Poisoning by Cotton Dyed with Lead Chromate.

DR. CARRY, of Lyon, reports on a series of poisoning cases among women engaged in winding yellow or orange yarns. All the symptoms indicated lead poisoning. Prof. Pouchet, of Lyon, however, found in three samples submitted to his examination no lead, and stated that the yarns were mordanted with a salt of antimony and dyed, No. 1 with Martins' yellow, No. 2 with Jaune solide, and No. 3 with "Jaune N. Poirrier." The writer obtained, at the request of Dr. Carry, specimens of the suspected yarns, and found, in concert with G. Schulz, of Berlin, that they were dyed with lead chromate, and not with the dyes above mentioned. Both the lead and the chrome were not merely qualitatively recognized but quantitatively determined. How Prof. Pouchet can have been deceived is questionable. The use of lead chromate is legal both in France and Germany. In an appendix, the author mentions that he found in a saddler's workshop in Berlin sewing thread dyed orange with lead chromate. It could scarcely be doubted that lead poisoning might ensue from the continued use of such thread.—*Chem. Zeit.* and *Sci. Am. Suppl.*

Hydroxylamine in Psoriasis.

HYDROXYLAMINE was first obtained by Lossen in 1865 from the reduction of nitrous acid; it is one of the bodies allied to ammonia, NH_3 being ammonia and NH_2OH hydroxylamine, and, like ammonia, has the peculiarity of readily entering into combination with hydrochloric acid.

NH_3HCl = ammonium chloride.
$NH_2OH.HCl$ = hydroxylamine hydrochlorate.

The hydrochloric combination of hydroxylamine is characterized by its ready solubility in water, alcohol, and glycerin, and these combinations turn blue litmus paper an intense red.

It is a narcotic, and produces paralysis of the nerve centres, and in large doses produces convulsions and death. Experiments upon animals and upon blood outside of the body have shown that oxyhæmoglobin of the blood is transformed by hydroxylamine into methæmoglobin by abstraction of oxygen. This reduction property which it possesses is very energetic and rapid.

In treating psoriasis, the author employs either an alcoholic solution, such as:

℞ Hydroxylamin. Hydrochlor.....gr. 3 to 8
Alcohol.....fl. oz. 4
Calcii Carbon.....q. s. ad neutr.

D. S. Apply with brush,

or a watery solution, applied as in a hydropathic band:

℞ Hydroxylamin. Hydrochlor.....gr. 16
Aquæ.....fl. oz. 32
Calcii Carbon.....q. s. ad neutr.

D. S. Apply as wet cloth.

As in other applications, the scales are to be first removed by bathing, rubbing with green soap, and applications of 10 per cent zinc salve. As this new substance has decided toxic properties, the 1 to 1,000 or 1 to 500 neutralized solution is used in the beginning, and the stronger applications, up to one-half per cent, are gradually employed, being painted on the diseased areas twice daily. A cloth wet in the solution, or a Priessnitz band, can be applied every two hours to suitable parts. As is the case with pyrogallol, chrysarobin, and some other substances, albumin may appear in the urine as a consequence of absorption of the drug.—After *J. Cutan. and Gen.-U. Dis.*

Concentrated Infusion by Cold Percolation.

WHAT is required in a concentrated infusion is, first, that it should when diluted yield a product as near like the fresh infusion in taste, color, and smell as is possible; secondly, that it should not be liable to decompose or deposit on keeping.

Two things must be borne in mind during preparation: that the drug to be treated be in the most suitable state of subdivision to allow the free extraction of soluble matter; and that the menstruum employed be the best adapted for that purpose.

Concentrated infusion of calumba is one of the most unsatisfactory for keeping. If prepared as follows a satisfactory article will result: Take picked calumba root, 2 lbs.; reduce to a uniform, very coarse powder in a drug mill; macerate the powder in a mixture of 12 oz. of rectified spirit and 48 oz. of distilled water. After forty-eight hours percolate slowly until no supernatant liquid remains; then add distilled water in small, successive portions until 80 oz. are collected. If the calumba root be too finely powdered, a semi-fluid, gelatinous mass will result upon maceration, rendering percolation almost impossible.

Infusion of gentian is perhaps in more constant demand than any other. Take gentian root, bruised, 8 oz.; dried orange peel, bruised, 8 oz.; fresh lemon peel, 16 oz. Dry the lemon peel with a gentle heat and cut small; macerate together with 50 oz. of distilled water and 12 oz. of rectified spirit for twenty-four hours; pack in a percolator and continue percolation with distilled water until 68 oz. have passed through; reserve this and continue adding more water until the marc is exhausted. If more than 12 oz. are required to effect this, evaporate the second percolate down to 12 fl. oz., and when cold mix with the reserved portion. Stand aside for twelve hours to allow any deposit that may form from the mixture of two solutions to settle; and then, if necessary, filter.

The quantity of menstruum required to effect exhaustion is resultant upon three things: that the drug should be thoroughly permeated by the liquid during maceration; the manner in which it is packed into the percolator; and that care be used in pouring successive portions of liquid over the marc, so as to avoid causing too rapid percolation, and still not allow air bubbles by the liquid falling below the top of marc. This applies equally to percolation at all times.

Acid infusion of roses is a favorite vehicle with some prescribers. The following method of procedure will yield a preparation in all respects superior to a fresh infusion: Take 1 lb. dried red rose petals, and break small by rubbing through a coarse wire sieve; macerate the broken petals with 70 oz. of distilled water, shaking frequently. After four days transfer to a percolator and exhaust as follows: Collect 1 pint of liquid and with this repercolate; repeat this with the second and third pints which pass through; displace by adding water in successive portions until the percolate measures 80 oz.; add to this 3 v. m. 20 pure sulphuric acid, and shake well together.

Most readers will remember at one time or another having had to use a "concentrated infusion of senega," with an unsightly-looking deposit at the bottom of the bottle, representing sometimes one-third of the whole bulk. Such a state of things may be obviated by making your own preparation as follows: Take senega root 2 lbs., reduce to a coarse powder, and macerate for forty-eight hours in 64 oz. of distilled water. Then allow to slowly percolate, and with the first portion which passes through repercolate, finally adding more water until the collected percolate measures 64 oz.; to this add 16 oz. of rectified spirit. Set aside for three days, filter, and make up to 80 oz. with distilled water.—*Br. and Colonial Drug.*

Note on Oil of Cassia.

SEVERAL pages in the October report of Messrs. Schimmel & Co., of Leipzig, are devoted to the controversy that has arisen upon the statements made by Messrs. Schimmel respecting the adulteration of certain brands of cassia oil (*Pharm. Journ.*, April 20th, p. 842). It will be remembered that the samples of oil that had been certified by the proprietor of a "medical hall" in Hong Kong as being pure and completely volatile were reported by Messrs. Schimmel to contain an ingredient that they had identified as petroleum, and to leave, on redistillation, 25 per cent of a solid residue that had been recognized as pitch resin. It appears that this report has drawn from the person responsible for the certificates, a Mr. Niedhardt, an assertion that Messrs. Schimmel's chemists have mistaken for petroleum a light hydrocarbon that is a natural constituent of genuine cassia oil, and that the resin was a natural product of alteration in the oil, which occurs to the extent of 30 or 40 per cent, even in an oil only a year old. In respect to the first point, Messrs. Schimmel protest against it being supposed that their chemists, who are engaged every day in dealing with essential oils, would confound with petroleum a terpene. Moreover, they state that after purification the substance in question has a specific gravity of 0.795 at 20° C., being considerably lower than that of any known terpene; also that it boils between 160° and 265° C., and is indifferent toward sulphuric acid. As to solid residue, it is pertinently asked how an oil that contained so much resin, even if it were a natural constituent, could be certified as "perfectly volatile." But the prevailing scarcity of pure cassia oil has had the effect of bringing into the market some old stocks, and afforded Messrs. Schimmel an opportunity of examining samples from seventy cases said to have been warehoused in Amsterdam for from nine to seventy years. These, whether distilled in a retort over an open fire or rectified by steam, gave as a distillate a clear oil, and the *residuum*, which varied from 5.5 to 8 per cent, was in every case *liquid* and did not solidify. Cassia oil distilled in Messrs. Schimmel's establishment from cassia chips, when redistilled at the end of four months, yielded 5.4 per cent of *liquid residue*, and an oil of the same age from cassia buds gave 4.4 per cent of liquid residue. As the result of this experience, the opinion is expressed that a good merchantable cassia oil should answer to the following characters:

1. It should have at 15° C. a specific gravity of 1.050 to 1.070.

2. Upon distilling, about 90 per cent of pure cassia oil should pass over, and the residue, which may amount to

6 or 7 per cent, and in no case to more than 10 per cent, should not become solid and assume a resinous appearance on cooling, but should remain semi-liquid at least.

Experiment has shown that no practical value as a test attaches to the relative solubility of cassia oil in alcohol when it contains an admixture of resin and petroleum.

It is thought that the determination of the value of mercantile cassia oils on a scientific basis will have to depend upon the quantity of *cinnamic aldehyd* contained in them. The percentages of cinnamic aldehyd obtained by Schimmel & Co. were as follows:

a. Pure Oils.

1. Home distillation from cassia chips.....88.9
2. Home distillation from cassia buds.....80.4
3. Brand "Ayong," age 60 to 80 years.....76.0
4. Brand "Ayong," age 24 years.....72.9
5. Brand "Ayong," age 20 years.....89.4
6. Brand "Hop Lee," very old.....76.6
7. Brand "Tai Foong," very old.....78.4

b. Adulterated Oils.

8. Brand "Yan Loong," 1st lot.....58.0
9. Brand "Yan Loong," 2d lot.....63.2
10. Brand "Cheong Loong," 1st lot.....58.7
11. Brand "Cheong Loong," 2d lot.....52.9
12. Brand "Cheong Loong," 3d lot.....57.8
13. Brand "Luen Tai".....47.1

The amount of cinnamic aldehyd in these oils was found by determining the percentage of non-aldehyds after separating the aldehyd by means of sodium bisulphite, but some skill is necessary to obtain exact results. The results show that the amount of cinnamic aldehyd is smaller in proportion to the increase in adulteration. Further investigation will be required, but at present it may be stated that a cassia oil that contains less than 70 per cent of cinnamic aldehyd may be considered adulterated, and that probably an oil containing less than 75 per cent should be looked upon with suspicion. For instance, a sample of oil, brand "Ayong," age 9 years, which yielded 79 per cent of cinnamic aldehyd, left a liquid residue from which 10 per cent of fixed oil was separated, so that before it was adulterated this oil would have shown nearly 90 per cent of aldehyd.

The principal non-aldehyd constituent of cassia oil has been ascertained by repeated fractionation to be the *acetic ether of cinnamyl*, $C_2H_3O_2.C_9H_9$, the portion boiling between 135° and 145° C. (at 11 Mm. atmospheric pressure) consisting entirely of that ether. The cinnamic alcohol, obtained by saponification, crystallizes from ether in white solid crystals, boils at 137° C. (11 Mm. pressure), and has a "somewhat hyacinthine odor." The presence of the acetic ether of phenylpropyl is also probable. Terpenes of the constitution $C_{10}H_{16}$ are not present, but probably sesquiterpenes and polyterpenes are. Free cinnamic acid, formed by oxidation of cinnamic aldehyd in contact with air, was found both in old oils and those freshly distilled, but always in small proportion.—After *Pharm. Zeit.*

Trade Interests in Germany.

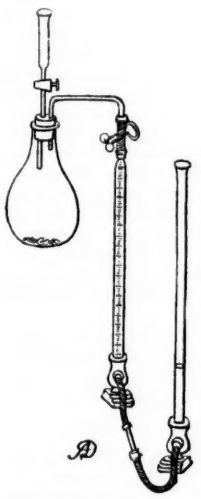
CONSUL-GENERAL MUELLER, in an exhaustive report on the "Commerce and Industries" of Germany, says in relation to the drug and chemical interests of the empire:

"The position held by Germany as one of, if not the leading drug, chemical, and dye producing countries was maintained during the year just closed. The Germans' determination to study, investigate, and experiment, never asking: 'Will it pay?' usually results in very profitable developments. The system of technical education is such as to aid men pursuing special branches. A large part of the world's rich trade in drugs is conducted or controlled by Germans. Of course, competition, both here and abroad, has reduced the profits on staple products to fair if not small margins; but firms holding letters patent or exclusive rights to the manufacture of specialties still reap large harvests of gain. Such profits are a constant stimulant to inventive endeavor, and have thus far resulted in an experimental activity whose gains have been enormous. Establishments in or near this city have assumed proportions more than colossal. One firm, namely, the Baden Aniline Company, requires more water and gas for its immense works than a city of 65,000 inhabitants; its stock is reported far above par, and its dividends are said to be simply enormous. The schools and universities enjoy a very high reputation in the matter of technical training in chemistry—a branch of the sciences upon which the drug, chemical, and dye trade is almost wholly dependent. Many young Americans are said to be here studying; hence the hope that the United States will soon have laboratories of its own, turning out men and work fully equal, if not superior, to those turned out and the work done here. There was an increase of $522,865 worth of drugs, dyes, etc., exported to the United States over 1887 from this district, viz., in 1887, $3,899,846.51; 1888, $4,422,711.55."

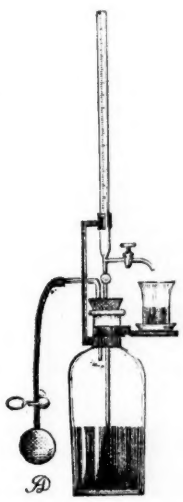
An Ideal Pomatum.—An Irish authority says that he is assured that a pomatum made as follows is an ideal one: Lanolin, 4 oz.; prepared lard, 1 oz.; rose water, 1 oz.; attar of roses, 10 drops.

APPARATUS FOR THE VOLUMETRIC ESTIMATION OF CARBONIC ACID.

A LITTLE flask of the capacity of 100 C.c., bearing in its stopper a thistle funnel with stop-cock, is connected, by means of a capillary tube, with a burette, which latter is again connected with a plain tube. About 0.1 to 0.2 Gm. of the carbonate to be examined—at all events less than would give off enough gas to occupy the full graduation of the burette—is placed in the flask. The stopper is then inserted, the stop-cock of the dry thistle funnel being open. Into the plain tube is now poured a sufficient quantity of saturated solution of chloride of sodium, so that the liquid in both tubes stands at exactly the same level, while at the same time the level of the liquid in the burette stands exactly at 0 (zero). All parts are, of course, suitably fixed in this position. The stop-cock of the thistle funnel is now closed and a little strong hydrochloric acid poured into it. Next, the plain tube is lowered so as to create a difference of levels, and the stop-cock of the funnel cautiously opened so as to deliver not more than one drop of the acid at one time. When the resulting effervescence has completely ceased, another drop is added, and this is continued until at the final addition of one or two drops no more gas is evolved. The liquid in the burette will, of course, be proportionately displaced by the gas, and the latter may be read off by volume, after the plain tube has been raised so as to bring the liquid in both tubes to the same level.—*Chem. Centralbl.*



Apparatus for Estimating Carbonic Acid.



Knoefler's Apparatus for Titration.

APPARATUS FOR TITRATION.

A USEFUL combination of burette and reservoir for the volumetric liquid is that devised by Dr. Knoefler (*Chem. Zeit.*, 1889, No. 35). As will be seen from the cut, the reservoir is a wide-mouth bottle, to the neck of which are fastened two holders, one for the burette and the other for the beaker containing the liquid to be assayed. The volumetric liquid is made to ascend into the burette by compressing the inclosed air by means of the rubber bulb. As the test liquid does not come in contact with any rubber, the apparatus may be employed for permanganate, nitrate of silver, etc. For caustic alkalies it is less suitable, unless the stop-cock is carefully paraffined.

Preparation of Sulphonal.

ACCORDING to the specifications of the patent granted by the German government, the following are the details of the process of making the new and popular chemical, sulphonal: 52 pounds of sodium ethylthiosulphate (produced by reacting upon sodium thiosulphate with ethyl chloride or bromide) are treated with 10 pounds of acetone and about 100 pounds of alcoholic hydrochloric acid. After several hours' quiescence or gently warming, about 70 per cent of the theoretical yield of mercaptol will have been formed. To this alcoholic solution water is added until all the mercaptol will have been thrown out of solution in the form of an oil, which latter is then oxidized to sulphonal by means of potassium permanganate. The rationale of the process is that the sodium ethylthiosulphate is split up in the presence of hydrochloric acid with the assumption of the elements of water, forming acid sodium sulphate and ethyl mercaptan. The resulting mercaptan is not separated, however, but is condensed at the moment of formation, in the presence of the acid, to mercaptol, which is less volatile and possesses a less abominable odor than mercaptan.

Bitters.

BITTERS may be roughly defined as "a compound prepared by steeping vegetable bitters, and some aromatics as flavoring, in weak spirits for eight or ten days; a little sugar or syrup being subsequently added to the strained or decanted tincture."

The vegetable bitters most in use are calumba, cinchona, cascarilla, chiretta, chamomiles, gentian, hops, orange peel, quassia, and wormwood; the latter five taking precedence, probably because of their ready manipulation and low cost. Many other bitters have been used, such as buckbean, 2 ounces of which are said to yield as much bitter as 1 pound of hops. The common box is much used in Parisian beer, according to a communication by Du Petit Thouars to the Philomathic Society. In some parts of France, as well as in Germany, the top of the common broom is employed; and this, as well as heath, has been used since time immemorial in Norway, Sweden, and Northern Scotland. In England mugwort has been used; and it is known that the foreign bitter, quassia, and likewise gentian, are much used in porter brewing. Gentian contains a saccharine principle which causes it to ferment rapidly and spoil. Calamus aromaticus yields a spicy bitter which entitles it to be used instead of hops, and it has been, and is now, largely collected for brewers [?] and manufacturers of bitters.

Amongst the objectionable bitters are nux vomica, bitter bean, cocculus indicus, and some others which it is not necessary to mention, as no reference will be made to them in the stock of recipes that are to follow.

It must now be supposed that we are addressing those who are about to establish a bitter, and so our recipes will be as practical as possible. Some modifications according to taste and fancy may be made if desired in any or all of them; but in the combinations that we offer them they are acknowledged to be as near perfection as possible. As to names, those we leave entirely to the ingenuity of the manufacturer, who will doubtless find a suitable cognomen for the bitter, guided in his selection by either the names or qualities of some of its constituents; or, possibly, he may surround the manufacture with a pleasant halo of classical fiction, and find a name for it amongst the gods and goddesses, or he may subsidize botany for a floral name, or the poets for one of fancy. In either case the name should be short, sharp, and decisive, not easy to imitate, and one that will catch the eye and arrest the inquiring attention of the public, and admit of an effective illustration.

Some of the following recipes are very good and very elaborate, too much so, in point of fact, for anything like practical commercial manufacture; but they are capable of supplying suggestions, therefore do we add them to our list.

To start with, then, let us take the recipe from which the celebrated Angostura bitters are made, and this by its effusiveness will lead you to question the possibility of its being a paying commodity; but it is, in spite of the circumstance that only a very small quantity is used at a time.

1. Take 4 ounces of gentian root, and slice up very thin; 10 ounces each of calisaya bark, Canada snakeroot, Virginia snake-root, licorice root, yellow bark, allspice, dandelion root, and Angostura bark. All these must be broken, bruised, or cut up small. Angostura is imported from South America, and is a very valuable bitter, being both aromatic and pungent. Six ounces of cardamom seeds; 4 ounces each of balsam of tolu, rhubarb, and galanga; 1 pound of orange peel; 1 pound of alkanet root; 1½ ounces caraway seed; 1½ ounces of cinnamon; 1½ ounces of cloves; 2 ounces of nutmeg, coriander seed, catechu, and wormwood; 1 ounce of mace; 1¼ pounds of red sanders, and 8 ounces of turmeric. Pound all separately and mix together, steeping for fifteen days in 50 gallons of proof spirit. Before filtering, add 30 pounds of honey.

2. Another very elaborate bitter is the following, which, however, has a wonderful flavor and American origin: Take of plain proof spirit 90 gallons; of red cinchona bark, 3½ pounds; calisaya bark, 3½ pounds; calamus root, 1½ pounds; orange peel, 4½ pounds; cinnamon, 3½ ounces; cloves, 3½ ounces; nutmeg, 3½ ounces; cassia buds, 2 ounces; red sanders, 6½ pounds. First mash all the ingredients, put them in the spirit, and let them infuse for fourteen days, stirring the mixture well twice every day. Rack off and color with 11 pints of brandy coloring, to get a dark red tint. Stir a quarter of an hour. Dissolve 30 pounds of white sugar in 30 gallons of water, add, and again stir for half an hour. Let the mixture rest for four or five days, and when bright, bottle. If the sanders is not used, the color will be a bright amber. Compounded according to the above directions, this will yield about 120 gallons at 25° below proof.

3. This next combination yields a very nice bitter, but you might have some difficulty in getting a supply of dried orange berries.

Macerate 2½ pounds ground dried small orange berries, ¼ pound ground dried orange peel, 2 ounces ground dried calamus root, 2 ounces ground dried pimpinella root, 1 ounce ground or cut hops, for fourteen days, with 10 gallons of spirit at 45 per cent; press, and add 2½ pints of brown sugar syrup. Filter. The color should be dark brown.

4. A splendid French bitter is made from 1½ pounds each red cinchona bark, calisaya bark, bitter orange peel, and sweet orange peel; 2 ounces of calamus root, 4 ounces of cardamom seeds, 1½ ounces each cinnamon, cloves, and nutmeg; 4 ounces of caraway seeds, and 3 pounds of wild cherry bark. Pound all these ingredients to a coarse powder and steep for fifteen days in 45 gallons of proof spirit, or 60 gallons of spirit 25° below proof, stirring occasionally. Then rack it off, and mix sufficient caramel (burnt sugar) to make it a dark red; add 15 pounds of white sugar dissolved in 15 gallons of water. Let the whole settle, then filter.

This bitter can be made of a handsome amber color by omitting the wild cherry bark and caramel coloring.

5. In Hamburg there is a firm manufacturing a bitter from the following recipe, which has a big demand. Grind to a coarse powder 2 ounces of agaric, 5 ounces of cinnamon, 4 ounces of cassia buds, ½ ounce of grains of paradise, 3 ounces of quassia wood, ¾ ounce of cardamom seeds, 3 ounces of gentian root, 3 ounces of orange berries dried, 1½ ounces of orange peel. Macerate with 4½ gallons of 95 per cent alcohol, mixed with 5¾ gallons of water; add 2¾ ounces of acetic ether. Color the liquid brown.

6. The Spanish people revel in a bitter made from the following ingredients: Grind to coarse powder 5 ounces of polypody, 6 ounces of calamus root, 8 ounces of orris root, 2½ ounces of coriander seed, 1 ounce of centaury, 3 ounces of orange peel, 2 ounces of German chamomile flowers; then macerate with 4¾ gallons of 95 per cent alcohol, and add 5¼ gallons of water and 1 ounce of sugar. Filter, and color brown.

Quite a number of recipes have been manufactured from the foregoing and varieties made of them, and some may feel disposed to work out one or two for themselves; but it is our idea that something of a much simpler character, if well concocted and carefully put together, might be made from the following recipes or their variations.

7. Grind to coarse powder 4 ounces of cinchona or of chiretta bark, 10 ounces of sweet orange peel, 1 ounce of lemon peel, 1 ounce of bitter orange peel, 1 drachm of cinnamon, 1 drachm of nutmeg, 1 drachm of cloves, and 30 cayenne seeds. Infuse for about ten days in 4 gallons of 65 per cent alcohol, and then filter off into bottles.

8. Several recipes are given for making orange bitters, from which we have selected the two following:

(*a*) Macerate 6 pounds of orange peel for twenty-four hours with 1 gallon of water, and then cut the yellow peel from off the white; or you may purchase the peel cut very thin in the first instance, chop it fine, or run it through a coarse mincer, and then macerate with 4¾ gallons of 95 per cent alcohol for two weeks, adding afterwards a syrup made of 16 pounds of sugar dissolved in 4¼ gallons of water. Filter through flannel.

(*b*) This is much stronger: Take of Seville orange peel 1 pound; of lemon peel, ½ pound; of gentian root, ½ pound; of ginger, ½ pound. Let them be bruised separately and set in an open cask or large crock, and 3 gallons of water poured over. Leave to macerate for three or four days, and then add 1 gallon of syrup and 1 quart of spirits of wine. Filter off and press the marc. The addition of a teaspoonful each of broken cinnamon and cloves adds much to the stomachic qualities and taste of the bitters. Twice the quantity of quassia may be used instead of the gentian, or half of each in proportion.

9. Bitters containing Peruvian bark are very much liked, so we give the following: Take of red Peruvian bark 8 ounces; orange peel, 8 ounces; 1½ drachms each of cinnamon, cloves, and nutmeg; and 75 cayenne pepper seeds. Infuse them, well bruised, in 8 gallons of proof spirit for fifteen to twenty days, stirring every day. Draw off and filter.

10. One more recipe, and we have done with them. For a good stomachic bitter we can strongly recommend the following: Grind to a coarse powder ½ pound of cardamom seeds, ½ pound of nutmeg, ½ pound of grains of paradise, ½ pound of cinnamon, ½ pound of cloves, ½ pound of ginger, ½ pound of orange peel, ½ pound of lemon peel, ½ pound of gentian root; and macerate them in 4¾ gallons of 95 per cent alcohol, and add before filtering a syrup made with 4½ gallons of water and 12 pounds of sugar....

With such an assortment of recipes no difficulty should be experienced in compounding a special high-class bitter that would be worthy of a special name and pay for attention; and we may further remind the enterprising reader that vanilla may be added sometimes in small quantities, and that bitters made from *coffee* or *tea* have not yet been placed on the market. Either of these can be worked in with other simple bitters, and a very taking quality superadded, even though the virtue might be a matter of question. Certainly the public do lean towards tea and coffee in whatever form they may be produced, as they did for a time towards *coca*.—*Mineral Water Trade Review.*

Radam's Microbe Killer is said by the *Western Druggist* to be composed of 4 drachms of oil of vitriol, 1 drachm of muriatic acid, 1 ounce of red wine, and a gallon of water.

Formulæ for the Use of Creolin.

DURING the last few years none of the more recent remedies has had such a rapid success as creolin, identical with a patent fluid of which a refined preparation has been named "Liquor Antisepticus." When creolin was suddenly recommended in Germany as an unsurpassed non-poisonous disinfectant, many voices were heard which objected to the use of a remedy that was a "patent article"; but the hesitation was soon overcome when it was found that the preparation really fully deserved the claims made for it. In many hospitals, clinics, and in private practice, creolin has completely superseded the use of corrosive sublimate, carbolic acid, iodoform, etc., in antiseptic surgery. Authorities like Von Nussbaum, Von Esmarch, Professor Fröhner, Dr. Kortum, have given such favorable verdicts on creolin that it has now become a generally used disinfectant—for instance, for sterilizing instruments before operation, for irrigation of wounds after operation. Creolin is especially convenient for the disinfection of the hands. In ophthalmic, aural, and gynecological practice its use has become general. For prevention of the formation of pus, and for deodorizing large carcinomata, profusely discharging ulcers, creolin has proved very successful. [We copy the preceding statements with the reservation that we know of equally high authorities who deny the exorbitant claims made in favor of creolin. —ED. AM. DRUGG.] The following are the daily formulæ in Germany:

Solutio Creolini (half per cent).

℞ Creolini ..... ♏ x.
Aquæ dest.... .... ℥ iv.

Sig. To be shaken for use. For the irrigation of wounds, impregnation of tampons, moistening of bandages, etc. Also for washing the genitals, and for syringing the uterus and vagina after delivery.

Solutio Creolini (two per cent).

℞ Creolini..... .... ℥ i.
Aquæ dest... .... ℥ vi.

Sig. To be well shaken before use. For the preparation of poultices and all dressings, for sloughing wounds, and for the disinfection of hands and instruments; also as a hæmostatic.

Injectio Creolini.

℞ Creolini..... ♏ ij. to x.
Aquæ dest..... .....ad ℥ iv.

Sig. The injections. As an injection for gonorrhœa, leucorrhœa, and catarrh of the bladder.

Pulv. Creolini.

℞ Creolini..... .... ♏ xxv. to ʒ i.
Acid. boracic..... ..... ℥ iij.

Sig. Antiseptic powder. For dry bandaging; for eczema in the neck or nose.

Oleum Creolini.

℞ Creolini..... ♏ xv.
Olei olivæ..... ℥ ij.

M. Sig. Antiseptic oil. For inunction of the hands in gynecological practice.

Pilula Creolini.

℞ Creolini .... ♏ xvij.
Extract. et pulv. glycyrrh..... ää q. s.

Make 100 pills. Coat with collodion. Sig. Two pills to be taken night and morning.

Ungt. Creolini.

℞ Creolini .... ♏ xij
Lanolini.... .... ℥ ss.

M. F. ungt.

—After *Provincial Med. Jour.*

Synthetic Carbolic Acid.

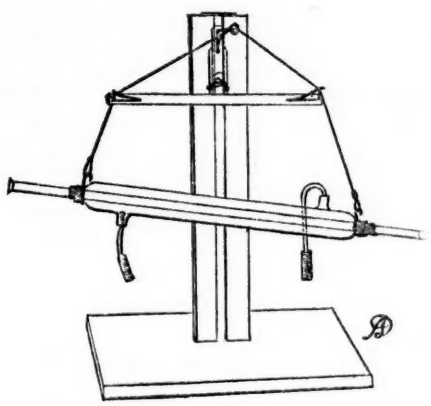
THE "Badische Anilin- und Soda-Fabrik" at Ludwigshafen on the Rhine announces that it has put on the market absolutely pure phenol, or carbolic acid, prepared by synthesis. Hitherto all carbolic acid used in medicine or the arts has been prepared from coal-tar. But such an acid is never quite pure, always containing certain impurities derived from the coal-tar. The best proof of the presence of the latter is the melting point. Pure carbolic acid melts at 41°–42° C. (106°–107° F.). The commercial "pure" acid melts at 35°–37° C. (95°–98.6° F.), and among the very best brands existing in the market none were found melting above 39.5° C. (103° F.).

The melting point of the new synthetically prepared acid is, as stated above, at 41°–42° C. It boils at 178° C. (352.4° F.), the exact temperature heretofore found for pure phenol. This temperature rises to 181° C. when the whole thermometer is surrounded by the vapors of the boiling acid. The synthetic acid is absolutely anhydrous and colorless, and is soluble in 12 parts of water to an absolutely clear liquid. The most characteristic difference between it and the acid prepared from coal-tar is the odor. All brands of the acid heretofore found in commerce possessed a more or less distinct tarry odor. The synthetic acid, however, has a faint "pure" odor, not in the least recalling that of coal-tar. The odor is almost unperceivable in a 5 per cent aqueous solution, which is not the case with the commercial sorts.

This synthetic acid is put on the market in two forms, in a coherent crystalline mass and in loose crystals.

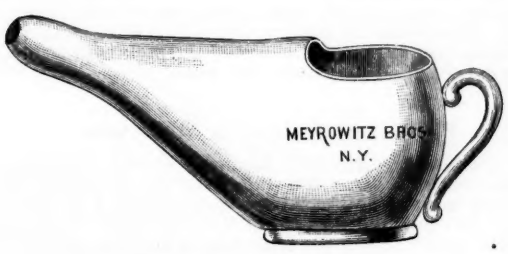
Gehe & Co., in their October report, state that the precise method by which the acid is prepared has not become known, but that it is probably produced during the process of sulphonizing benzol and subsequent fusion of the benzol-sulphonate with caustic alkali.

The price of this synthetic acid is quite reasonable. It is quoted by Gehe & Co. at 4.60 marks per kilo, while the pure redistilled coal-tar carbolic acid is quoted at 4.10 marks. These figures will at least show the *relative* value of the two products at Dresden.



AN IMPROVED CONDENSER STAND.

AT a recent meeting of the Chemical Society, held at London, Mr. A. H. Allen described the following improved form of condenser stand, devised by Mr. W. Chattaway and himself, which allowed the condenser to be reversed at any moment without disconnecting the distilling flask, while it permitted of the contents of the latter being agitated whenever desired. This was done by hanging the condenser from a stout leather thong, which passed over three small brackets attached to a piece of wood working vertically in a slot in the stand. The thong could be fixed by means of a screw at the end of the centre bracket. In practice the arrangement had proved very efficient and convenient.—*J. Soc. Chem. Ind.*



DESSAR'S NASAL DOUCHE.

THE Thudichum nasal douche, heretofore in quite common use, has been the cause in numerous instances of intense inflammation of the middle chamber of the ear and loss of hearing. A substitute for this apparatus, suggested by Dr. L. Dessar, is shown in the adjoining cut. It is impossible, in its use, to have any excess of force, and this objection to the Thudichum douche is therefore avoided. It consists of a glass vessel holding about 2½ ounces. The solution, warmed to a proper temperature, is placed in the cup, and, the nozzle being inserted firmly into one nostril, the head is tilted backward and the cup raised. When the fluid is felt in the throat, the head is tipped forward and the mouth opened, whereupon the liquid will flow from the nostrils. Meyrowitz Bros., of New York, are the makers.

Green Mountain Salve.—Resin, 5 pounds; burgundy pitch, beeswax, and mutton tallow, of each ½ pound; oil of hemlock, balsam of fir, oil of origanum, oil of red cedar, and Venice turpentine, of each 1 ounce; oil of wormwood, ½ ounce; verdigris, very finely pulverized, 1 ounce. Melt the first three articles together and add the oils, having rubbed the verdigris up with a little of the oils and put in with the other articles, stirring well; then pour into cold water and work as wax until cool enough to roll.—*Formulary.*

The Arrow-root Plant.

MR. WILLIAM T. BRIGHAM, in his interesting work on Guatemala,* thus describes the preparation of cassava bread from the roots of the "arrow-root" plant:

In our walks about the town we were often politely invited into the houses, and so had a chance to see the cassava-bread making. The tuberous roots of the manioc (*Manihot utilissima*) often attain a weight of twenty or thirty pounds, and are full of a poisonous juice, deadly when swallowed. A mahogany board is provided, into which broken crystals of quartz are inserted, and this serves to grate the root into a coarse meal, which is washed carefully (the starch is partly removed, and settles in the water as tapioca), and is then placed in a long sack of basket-work, called very appropriately *serpiente*. This ingenious press is fastened at one end to a house beam, while on a lever placed through the loop at the other end all the children of the family sit in turn, or together if they are small; and the squeezed mass is dexterously made afterwards into flat loaves, about three feet in diameter, and not more than a quarter of an inch thick, dried, and then baked. The result is a wholesome and very nutritious bread, which keeps a long time and is capital on an excursion. Later on, when our own housekeeping was in order, we found it made excellent puddings, and was better than crackers in soup; while in the woods it was indispensable. It is also a capital diet in dyspepsia, can be eaten in sea-sickness when all other food is rejected, and serves to fill out the bony outlines of an emaciated human frame better than anything else. The clean white loaves can be easily exported, and are very attractive.

Sarsaparilla in Guatemala.

MR. WILLIAM T. BRIGHAM, in his work on "Guatemala,"* thus refers to the species of sarsaparilla he met with in that country:

One of the most troublesome vejucos, or vines, common all through the forests of the Atlantic seaboard, is the zarza, or sarsaparilla. Probably the American public is familiar with the popular remedies compounded in part with this valuable medicinal plant, which, belonging to the Smilax family, affects damp, warm forests, climbing to great heights over the trees. The portion used is the long, tough root; this the zarza gatherer digs and pulls from the loose soil, replanting the stem, which in due time replaces its stolen roots, to be again robbed. The roots are washed, loosely bundled, and sold to the dealers, who have the fibres made up into tight rolls, a few hundred of which are then pressed together and sewed up in the thickest hide that can be found; for the "custom of trade" includes the wrapper in the tare of the more costly drug. Most of the sarsaparilla exported from Belize comes from Guatemala and Honduras; but from Livingston more than 60,000 pounds were exported in 1884, of an appraised value of ten cents per pound. The plant is easily propagated by cuttings or seeds, and, of course, needs no cultivation or cleaning; the yield will average 20 pounds of dried root from each plant.

Plants with Dulcifying Properties.

AT a recent meeting of the Linnæan Society, a specimen of the fruit of *Sideroxylon dulcificum*, the so-called "miraculous berry" of West Africa, was exhibited by Mr. D. Morris, the assistant director of Kew Gardens. He stated that the sweet pulp of the fruit, which is about the size of an olive, imparts to the palate a sensation which renders it possible to partake of sour substances, such as tartaric acid, lime juice, and vinegar, and gives them a flavor of absolute sweetness. The fruit of another plant, *Thaumatococcus Danielli*, possessing similar properties, was also shown, living plants of both having been recently received at Kew from Lagos from Governor Moloney. The *Sideroxylon* is mentioned by Dalzell in his history of Dahomey, where it is stated to be used by the natives to render palatable a gruel made from bread after it has become too stale for any other purpose. Unfortunately the peculiar sweetening principle is soon dissipated if the fruit remains ripe for any length of time. Preservation in spirit, acetic acid, or syrup does not appear to favor the retention of the dulcifying principle, according to Dr. Daniell, since he found that specimens of the fruit brought to England became insipid and lost their properties. In the case of *Thaumatococcus Danielli*, however, the properties of the mucilage surrounding the seeds appear to be retained much longer when the fruits are preserved in syrup. It would be interesting to ascertain the nature of the sweet substance contained in the fruits, and it may be hoped that the Kew authorities will not let so interesting a question fall to the ground without some attempts being made in various ways, such as obtaining the dried unripe fruits, to extract the dulcifying principle of these fruits.—*Sci. Amer.*

* "Guatemala, The Land of the Quetzal." 8vo, London, 1887.

Uranium.

EXACTLY a century ago—namely, in 1789—Klaproth isolated from a dark-colored mineral, known as pitchblende, a yellow oxide which, after carefully testing, he pronounced to be the oxide of a new metal. To this metallic substance he gave the name of uranium, so calling it after the planet Uranus, then recently discovered by Herschel, and it was at once classed among the rare metals, and still remains so. Its rarity is indicated by its market price, which is about £2,400 per ton. The oxides and salts of this rare metal are chiefly used for making greenish-yellow tinted glass, in producing the costly black porcelain, and as a substitute for chloride of gold in photography. Ores containing the metal are found in Cornwall, Saxony, and Bohemia, but up to the present time it has only been met with in isolated pockets and patches. The centenary of its discovery by Klaproth has, however, been marked by the finding of a continuous lode at the Union Mine, Grampound Road, Cornwall, which is believed to be the only known lode in the world. This discovery is regarded as unique in the history of the metal, for the lode is what is known as a true fissure vein, and the ore is found to contain an average of 12 per cent of the pure metal, the assays going up as high as 30 per cent in some parts of the lode. Several tons of the ore have already been raised and sold, fetching high prices. It is anticipated that the present discovery will enable two important applications of the metal to be followed up. The first is as a substitute for gold in electroplated ware, inasmuch as with platinum and copper it forms two beautiful alloys, each having the appearance of gold, and the former also resisting the action of acids. The second application is in connection with electric installations, where its usefulness consists in its high electrical resistance.—*Chem. and Drugg.*

Insect-flower Growing in California.

The insect-flower plant (*Pyrethrum cinerariæfolium*) is now being grown on a large scale in California, and the powdered flowers are sold in that State under the name of buhach. The plant was first introduced into California about twelve years ago by a Mr. Mileo, a native of Dalmatia, who succeeded, after some trouble, in growing the plant on an extensive scale, and in 1880, associating himself with other capitalists, established the Buhach Producing and Manufacturing Company. At the present time the company have about 300 acres of this plant under cultivation at their farm near Atwater, Merced Co., California, and own mills for grinding the dried flowers to powder at Stockton, near San Francisco. The cultivation of the *Pyrethrum* requires careful and intelligent supervision, and it cannot be grown successfully without irrigation. It requires three years from the time of sowing to grow plants capable of producing a paying crop of flowers, and then they will bear from four to five years longer. It is at its prime, however, in its fourth or fifth year. The plant grows about 30 inches high, and is set out in rows 4 feet apart, and from 15 to 24 inches apart in the rows. The flowers are harvested towards the latter part of May. The stalks are cut just above the roots, and the flowers stripped from them by passing the plants through a kind of comb. The detached flowers fall into a box below, and are carried to the drying-ground, where they are spread on sheets and exposed to the rays of the sun during the day, being repeatedly turned over in the meanwhile. They are covered during the night to prevent their absorbing moisture, as the perfect drying of the flowers is most important in order to retain the volatile oil which gives the powder its insecticide properties. It is also very necessary that this operation should be done quickly, and that the flowers during the drying process should be protected from moisture. A slight dew falling upon the flowers at this time will injure their color and reduce their strength as an insect destroyer. In this respect, the California-grown flowers are said to be better cured, and consequently more valuable, than those produced in Dalmatia, the peculiar conditions of soil and climate in California being extremely favorable to the growth and curing of plants rich in the essential oil which renders them so destructive to insect life.

New Method of Making Acetate of Lead.

MR. H. LÖWE has recently obtained a German patent for making acetate of lead as follows:

The lead in the form of thin plates is exposed to the attacking influence of acetic acid containing 40 per cent of nitric acid added to it. The decomposition is effected rapidly and with a slight evolution of heat; the vapors which rise from the vat in which the oxidation is being carried on are collected and led into a condenser—thus nothing is lost.

Although nitric acid is employed, the solution obtained when the lead is all dissolved contains no nitrate of lead. On evaporating slowly, crystals of lead acetate are gradually thrown down. The expense of producing sugar of lead by this new method is asserted to be much less than by any other.—*Deutsch. Indust. Zeitung.*

Norwegian Cod Fisheries.

THE principal cod-fishing, which takes place in the district of Lofoten from middle of January to middle of April, finished with a result of 17,000,000 fish, 20,300 barrels of liver, 17,000 barrels of spawn, and 11,100 barrels of crude steam-rendered oil. The gross value of the catch is estimated at $1,554,500. The returns of last year's catch were 26,000,000 fish, 32,700 barrels of liver, 33,600 barrels of spawn, and 13,800 barrels of crude steam-rendered oil. The gross value of the same was estimated to be $1,600,000. In the year 1887 the fishing in Lofoten yielded 29,700,000 codfish; in 1886, 31,000,000; and in 1885, 26,600,000; this season's catch is thus the smallest for a number of years. The large deficiency is partly to be attributed to roughness of the weather during the fishing season, and partly to scarcity of fish present on the fishing grounds. It was repeatedly stated by the inspectorate of Lofoten, as a reason for the poor catch, that when the weather permitted fishing the fish remained in deep sea and did not run up on the banks, on account of a low temperature of the sea. This unusual phenomenon lasted during the whole season.

The fish were this season of smaller size than last year; the fatness of the liver was, however, about the same, viz., from 250 to 350 fish per hectoliter of liver (hectoliter = 2.838 bushels). At the end of the season the liver of the fish is always leaner than in the beginning. The prices paid for the fish were very high, and began with 20 kroners (kroner = 26.8 cents) per 100 fish early in the season, and advanced to 30 kroners later on. The average gross profit for each fisherman is estimated at $51, against $50 in 1888. The profit for the fishermen was, however, most unevenly divided, on account of the catch being good at some places while very poor at others. Many of the fishermen had thus to return to their homes without profit at all. The number of fishermen that participated in the catch is stated to have been 30,080. The highest number of boats present was 7,043, and of vessels buying fish 644.

The returns of the catches taking place in the adjoining districts have not yet been issued. They are, however, all of less importance, as the fishing in those districts was constantly interrupted by stormy weather.

In the southern fishing district of Sondmore this season's catch was successful. The returns thereof were 5,000,000 fish, 13,000 barrels of liver, 9,400 barrels of spawn, and 3,900 barrels crude steam-rendered oil. In the neighboring district of Romsdal the fishing yielded 2,000,000 codfish.

In the Finmarken district, where the fishing has begun anew, the yield to date has been about 4,000,000. The latter district is, next to Lofoten, the most important, but the fishing there is also more treacherous than in any other district, and therefore not to be relied upon. The actual prospects for a continuance of the fishing in Finmarken are good.—*U. S. Vice-Consul* J. C. ISDAHL, *Bergen.*

The Manufacture of Essence of Lemon in Sicily.

THE United States consul at Messina describes the mode of manufacturing essence of lemon in Sicily. With three strokes of a sharp knife the cutter peels the lemon lengthwise and lets the peel fall into a tub under the chopping block. He then cuts the lemon in two and throws it from his knife into a bucket. He works with wonderful rapidity, and fills from 10 to 12 tubs with peel a day, and is paid 2½d a tub weighing 77 pounds. His left hand and right index finger are protected with bands of osnaburg or leather. The fresh peel is soaked in water fifteen minutes before the essence is extracted. Peel that has stood a day or two remains soaking from thirty to forty minutes, that it may swell and offer a greater resistance to the sponge. The workman holds a small sponge in his left hand, against which he presses each piece of peel two or three times—simple pressure, followed by rotary pressure. The women employed in this work run a piece of cane through their sponges to enable them to hold them more firmly. The outside of the peel is pressed against the sponge, as the oil glands are in the epicarp. The crushing of the oil cells liberates the essence therein contained. The sponge, when saturated with the essence, is squeezed into an earthen vessel held in the lap. The peel is so thoroughly pressed that not a single cell escapes. This is ascertained by holding the pressed peel to the flame of a candle; should it neither crackle nor diminish the brilliancy of the flame, the cells are empty. This process yields, besides the essence, a small quantity of juice and feccia (dregs). The separation of the essence, juice, and feccia soon takes place if the vessels are not disturbed; the oil floats on the juice, and the dregs fall to the bottom. These three products derived from the peel have no affinity with each other. As the essence rises to the surface it is skimmed off, bottled, and left to settle for a few days. It is then drawn off with a glass siphon into copper cans, which are hermetically sealed. After the essence has been expressed, a small quantity of juice is pressed from the peels, which are then given to oxen or goats, or thrown on the manure and well rotted, or they would make too heating a fertilizer. The yield of essence is variable. The industry is carried on five months in the year. Immature fruit contains the most oil. From November to April in the province of Messina 1,000 lemons yield about 14 ounces of essence and 17 gallons of juice. The essence is so valuable that the workmen are closely watched, for they are most ingenious in secreting it about their persons. Six men work up 8,000 lemons a day; two cut off the peel, while four extract the essence and obtain 136 gallons of lemon juice and 7 pounds of essence. Dealers sometimes [?] adulterate their essences with fixed oils, alcohol, or turpentine, but these mixtures may be easily detected. The essence of bitter orange mixed with the essence of lemon produces an aroma similar to that of the essence of bergamot.—*Br. and Colonial Drugg.*

Perfumery Formulæ.

A CORRESPONDENT of the *Chemist and Druggist* has furnished the following four formulæ for eau-de-cologne:

	I.	II.	III.	IV.
Oil of Bergamot	½ oz.	12 min.	7½ drch.	6 drch.
" " Lemon	½ oz.	12 min.	2 drch.	1 oz.
" " Rosemary (Engl.)	1 drch.	12 min.	10 min.	½ drch.
" " Citronella	20 drops	....	....	....
" " Neroli	1 drch.	12 min.	2 drch.	1 drch.
" " Orange Peel	....	12 min.	2 drch.	....
" " Lavender (Engl.)	....	....	20 min.	1 drch.
Tinct. of Musk (1 3 in 16 oz.),	....	....	....	4 drch.
Cardamom Seeds, powd.	....	60 grs.	....	....
Orange Flower Water	....	....	17½ oz.	....
Alcohol	32 oz.	1 pint	66½ oz.	4 pints

N.B.—The weights and measures are understood to be British.

Some New Compounds of the Quinine Alkaloids.

THE compounds of phenol with some salts of the quinine alkaloids of left-handed polarization have long been known and are much used as febrifuges, as, *e.g.*, quinine phenol sulphate $(C_{20}H_{24}N_2O_2)SO_3.C_6H_6O+2H_2O$. The author has recently prepared a new compound of phenol with quinine bisulphate. If carbolic acid be added, in equivalent proportion, to a hot aqueous solution of quinine bisulphate, on cooling at first an oily mass separates out, above which delicate white needles are gradually formed, of the composition $C_{20}H_{24}N_2O_2.SO_3.C_6H_6O+3H_2O$. This compound is very unstable. If it be dissolved in hot water, on cooling the first-named normal salt crystallizes out. Quite in accordance with this is the behavior of the acid quinine resorcinol sulphate, the acid quinine quinol sulphate, the acid quinine pyrogallol sulphate, and the acid cinchonidine pyrogallol sulphate, for, one and all, they separate out the normal salts when the attempt is made to recrystallize them from hot water. The author further prepared and describes the normal quinine orcinol sulphate, quinine catechol sulphate, cinchonidine quinol sulphate, as well as the quinine resorcinol, quinine catechol, and quinine pyrogallol hydrochlorides. They are beautifully crystallized compounds and some of them excellent febrifuges.—J. HESSE in *Ph. Zeit.* and *J. Soc. Chem. Ind.*

Dithio-salicylic Acid.

WHILE working in the chemical laboratory of the Society of Physicists in Frankfort-on-the-Main, Herr H. Baum, chemist, recently discovered a substance which is likely to compete with salicylic acid as a remedy and antiseptic. This new substance, dithio-salicylic acid, consists, as it were, of 2 molecules of salicylic acid concatenated into 1 molecule by 2 atoms of sulphur (the *Lancet*). The well-known bacteriologist, Professor Hueppe, of Wiesbaden, has ascertained that a 20-per-cent solution of sodium-dithio-salicylate kills anthrax spores in forty-five minutes, whereas sodium salicylate under the same conditions has no perceptible effect. Its effect on cholera and typhus bacteria, on the bacterium of green pus, and on the staphylococcus aureus, is much stronger than that of sodium salicylate. Sodium-dithio-salicylate II. (there is a similar substance called sodium-dithio-salicylate I.) has been tried in many cases of acute rheumatic fever in Dr. Knoblauch's wards in the city hospital of Frankfort. In the slighter cases a dose of 3 grains was given every morning and evening; in the severer ones the same dose every morning and two, three, or four times an hour every evening. In slight cases pain, fever, and swellings disappear after two days; in severer ones, after six days at most. As compared with sodium salicylate, sodium-dithio-salicylate possesses the following advantages: Stronger effect and consequent adequacy of smaller doses, no bad effects on stomach, heart, and vessels, no collapse, no humming in the ears. A Frankfort physician had given a patient who was suffering from acute rheumatic fever 6 ounces of sodium salicylate without any essential alleviation. He then tried the new remedy, giving the patient four doses of 3 grains daily, which cured him in five days.

Ipecacuanha for Insect Bites.—An application for insect bites, said to be in common and successful use in India, consists of ½ ounce each of powdered ipecac and alcohol and ½ ounce of sulphuric ether.

Standardized Preparations of Ipecac.*

THE authors propose to employ a fluid extract of ipecacuanha of standardized emetine strength as a basis for the various fluid preparations of the drug, particularly the wine. They find that when the root is treated first with rectified spirit, and subsequently with the same menstruum in conjunction with lime, complete removal of the emetine is effected. A fluid extract so prepared is afterwards standardized so as to contain 1.25 parts of emetine in each 100 fluid parts of the extract. This estimation is effected by a modification of Ransom's process, in which the impurities existing in the crude extract are removed by basic lead acetate, the resulting alkaloidal filtrate being titrated by Mayer's solution. Throughout the experiments the same sample of assayed root was employed, and results verified by estimating the alkaloid in the marc as well as in the various extracts.

From the standardized fluid extract they prepare the wine by diluting it to 20 volumes with sherry, allowing to stand, and filtering. It is claimed that the wine so produced is fully equal to that of the present Pharmacopœia in elegance, while it considerably exceeds it in alkaloidal strength.—*Chem. and Drugg.*

[Another paper by the same authors, on "Vinum Ipecacuanhæ Brit. Ph.," is abstracted in the following:]

Applying to the wine the method of assay described in the previous note, the authors find, when prepared by the official process, although the root is exhausted, a portion of the emetine is subsequently lost. This loss is traced to the heating necessary to produce the powdered extract. Examination of "trade samples" confirms the results obtained on the small scale with assayed root. The figures for emetine obtained from a volume of wine equivalent to 10 parts of root range from 0.1077 to 0.0378. Out of 11 samples examined, however, 7 give between 0.0756 and 0.066. A sample of wine prepared by the process of the previous (1867) Pharmacopœia gave 0.1228 part of emetine; a similar volume of the official wine made from the same root gave 0.0812 part, the root itself 0.132 part. The conclusion arrived at is that, although the present process fairly exhausts the drug, the subsequent loss of a part of the emetine renders the preparation much less rich in its active ingredient than its predecessor, notwithstanding that it is admitted on all hands to be a more "elegant" preparation.

Specimens of standardized fluid extract and of the wine prepared from it were shown; also "Vinum Ipecacuanhæ Brit. Ph. 1885," made at the same time and from the same ingredients. It was seen that the standardized wine was quite as elegant as, if not more so than, the less active official preparation.

Gelatin—What it is, and the Process of its Manufacture.

THE term gelatin, says a contemporary, although usually applied to only one variety of the substance obtained by dissolving the soluble portion of the gelatinous tissue of animals, nevertheless properly belongs also to isinglass and glue, which are modifications of the same material. Vegetable jelly is also analogous, and will be mentioned under this head. Gelatin and glue signify the more or less pure and carefully prepared jelly of mammalian animals, but the term isinglass is applied only to certain gelatinous parts of fishes, which, from their exceeding richness in gelatin, are usually dried and used without any other preparation than that of minute division for the purpose of facilitating their action.

Gelatin (proper) is prepared for commercial purposes from a variety of animal substances, but chiefly from the softer parts of the hides of oxen and calves and the skins of sheep, such as the thin portion that covers the belly, the ears, etc., also from bones and other parts of animals. The general method adopted with skin parings or hide clippings is first to wash the pieces very carefully; they are then cut into small pieces and placed in a weak solution of caustic soda for a week or ten days, the solution being kept moderately warm by means of steam pipes. When this process of digestion has been sufficiently carried on, the pieces of skin are then removed into an air-tight chamber lined with cement, and here they are kept for a time, determined according to the skill of the manufacturer and the kind of material employed, at a temperature of 70° F. They are next transferred to revolving cylinders supplied with an abundance of clean cold water, and afterwards are placed, still wet, in another chamber lined with wood, in which they are bleached and purified by exposure to the fumes of burning sulphur; they next receive their final washing with cold water, which removes the sulphurous acid. The next operation is to squeeze them as dry as possible, and transfer them to the gelatinizing pots, which are large earthen vessels inclosed in wooden cases made steam tight. Water is poured in with the pieces and kept at a high temperature by means of the steam in the cases surrounding the pots. By this means the gelatin is quite dissolved out of the skin, and is strained off while still hot; it is poured out in thin layers, which, as soon as they are sufficiently cooled and consolidated, are cut into small plates, usually oblong, and laid on nets, stretched horizontally, to dry. The cross-marking observable on the plates of gelatin are the marks left by the meshes of the nets.

Another process consists in treating pieces of calfskin by water alone, without the soda and sulphur processes; the pieces after simple washing being transferred at once to the pots to be acted upon by the steam. Undoubtedly this is the purest, but expense of preparing it prevents its general use. Inferior gelatin is made from bones and other parts of animals, and it has been stated by an eminent authority that in Paris the enormous number of rats which are occasionally killed in the sewers and abattoirs, after being deprived of their skins, which are reserved for other purposes, are all used by gelatin makers. These materials are placed in cages of wire, which are placed in steam-tight boxes, where they are submitted to the direct action of steam at 223° F., but at a low pressure; and cold water, supplied by another pipe through the upper part of the box, is allowed to flow slowly and percolate through the contents of the cage. The water and condensed steam descend to the bottom charged with gelatin, and are drawn off by a stop-cock placed there for the purpose.

The French manufacturers succeed better than any others in clarifying the inferior gelatins, and they rarely make any others; they run their plates out very thin, which gives them greater transparency and apparent freedom from color; and they color them with most brilliant colors and form very fine rolled sheets, tempting the eye with an appearance of great delicacy and purity, which would at once disappear if the material were made up into thicker plates.

The purity of gelatin may be very easily tested thus: Pour upon dry gelatin a quantity of boiling water; if pure it will form a thick, gluey, colorless solution, free from smell; but if made of impure materials it will be of a very offensive odor and have a yellow, gluey consistence. No article manufactured requires such careful selection of material and such nice and cleanly manipulation to insure a good marketable character; and those anxious for purity should avoid all artificially-colored varieties, however temptingly got up, unless they are required for merely decorative purposes and not for food.

How to Use Gold Leaf.

GOLD leaf is a thing which it is impossible to manage unless one knows how, and yet we often have occasion to repair gilt articles of various kinds, or "touch up" a picture frame, etc. The usual practice is to apply some of the many gold paints, and the invariable result is a nasty patch, which to a critical eye is worse than the original flaw.

But besides patching and mending, gold leaf is highly effective in combination with black for the ornamentation of various articles of furniture which amateurs often construct for themselves. A book of "gold leaf" which is quite good enough for such uses may now be bought cheaply; indeed, this German gold is quite as good for inside work as the "real thing."

Having procured a book, lay it flat upon a table and carefully open the first leaf, when the metal foil will lie before you; with a pair of sharp scissors cut off the paper leaf you have just raised; lay it flat upon your open hand and rub it on your hair; whether you use pomatum or not, there will be sufficient grease to answer the end in view. Now lay the paper upon the foil in the original position and press firmly with the hand; lift carefully, and the gold will be found adhering. This paper leaf, with foil attached, will now bear to be carried about, and may be cut up with scissors to size and shape required. The same process may next be carried out for as many leaves as we need for the job in hand.

Having said so much about gold leaf, we add a hint as to the method of laying it on, in case the reader does not know.

Paint the part you wish to gild with gold size, and be very accurate, as the leaf will stick to every spot touched; this size will dry rapidly, and when it is just not dry, or "tacky," *i.e.*, sticky, cut a piece of your leaf a little larger every way than your design, etc., press it firmly, and then lift the paper; do not touch it again till quite dry, when you may remove the surplus foil with a large, soft camel's-hair brush, or "dabber."

For illuminations, etc., gum arabic may be used instead of gold size, and may be allowed to dry, breathing upon it for a few seconds when you wish to apply the gold.—*Oil and Colorman's Journal.*

Purification of Naphthalene.—It has recently been found that by treating boiling naphthalene with ½ to 2 per cent of its weight of sulphur the impurities are decomposed, sulphuretted hydrogen being evolved, and bodies of high boiling point being formed; from these the naphthalene can easily be separated by distillation. The sulphuretted hydrogen may be absorbed by soda or milk of lime. This is considered a great improvement on the old sulphuric-acid method.—*Chem. and Drugg.*

* Abstract of a paper by J. OLDHAM BRAITHWAITE and JOHN C. UMNEY, read at the recent British Pharmaceutical Conference.

The Cutting of Spectacle Lenses.

THE work of cutting is all performed with a tiny fragment of diamond, known in the trade as a spark. It is not every spark, however, that will cut a lens. The sparks are mounted in the following manner: A piece of brass wire is selected, say $\frac{3}{16}$ of an inch in diameter, a hole is drilled in the end large enough to admit the spark, and it is set in the hole with the point up. The outer edge or shell of the wire is beaten inward and holds the spark firmly in place. The wire is then placed in the lathe and cut off just back of the spark, turning the end hemispherical, using the point of the spark that sticks through the brass as a centre. A piece of steel wire is next selected of the same diameter as the brass wire, and the end is turned in, forming a cup. The mounted spark is then soft-soldered into this cup and it is ready for the machine, which works automatically from a pattern, and can be set to cut larger or smaller than the pattern. Before the mounted spark is placed in the machine, however, it is tested by holding the handle upright. If it does not cut in an upright position, the point is unsoldered by means of the blowpipe and the handle resoldered, leaving the cutting point at the required angle, while the handle itself is upright. When the spark is found to cut well in an upright position, it is then placed in the machine for trial. The glass is placed upon a pad under the spark, the glass varying in form according to the kind of lens being cut. If the lens is flat, the pad is also, and if the lens is convex the pad is concave and must be a perfect fit; for the better the fit, the more accurate will be the work. The pattern and glass travel around while the diamond remains stationary.

The life of a spark is short; some lasting only one day, while once in a while they can be worked for a year. The workmen average fifty dozen pairs of lenses per day. A good diamond will cut an average of 1,500 dozen pairs. The average lens measures four inches around, and a dozen pairs would be eight feet. In cutting 1,500 dozen pairs the spark would travel over a surface equal to a piece of glass 12,000 feet long. There are exceptional sparks that cut for months. I now have one which has been in operation for fifteen months and has cut 7,200 dozen pairs, travelling about 57,600 feet. We use two kinds of sparks, the Brazilian and the African, and they cost from $3 to $5 each.—*The American Jeweler.*

Note on Hypophosphorous Acid as a Solvent for Strychnine and Morphine.*

IN searching for readily soluble salts of strychnine and morphine for hypodermic medication, I was struck with the extreme solubility of both alkaloids in dilute hypophosphorous acid; and the ease with which these alkaloids dissolve to form neutral, or practically neutral, solutions, when hypophosphorous acid is employed, points to a possibly advantageous use of such compounds for hypodermic injections.

In the case of hypophosphite of strychnine, it appears to be a very stable salt in solution, and hypophosphorous acid might, I think, be usefully employed, not only to form a hypodermic injection, but in place of the hydrochloric acid ordered for making liquor strychninæ, P. B., as the official preparation sometimes gives trouble in cold weather from the separation of crystalline matter.

The morphine combination also appears to keep better in solution than the acetate, and would more easily afford a stronger solution than the official "Injectio morphinæ hypodermica," in cases where such was required.

A solution of 1 in 6 is sometimes wanted, and the ready solubility of hypophosphite of morphine allows of this being easily made, or even of a very much stronger solution. Thus, for a concentrated injection intended for veterinary use, I found no difficulty in preparing a solution four times the strength of the official injection.

The solutions so produced with hypophosphorous acid, and using a slight excess of morphine or strychnine, are neutral, or only very faintly acid. In the case of morphine I have found it advantageous to make a decidedly strong solution, to estimate the morphine, and dilute to the required strength.

Morphine hypophosphite is so readily soluble that crystals only separate from a thick, syrupy mother-liquor after keeping for some time.

Strychnine hypophosphite can be more easily obtained, as, although exceedingly soluble, the highly concentrated solution solidifies on cooling to a crystalline mass, from which the salt can be separated.

The salts of both alkaloids would well repay an extended examination, both as to composition and solubility.—*Chem. and Drugg.*

Danger in Silk Thread.—Silk thread is soaked in acetate of lead to increase its weight, and persons who pass it through the mouth in threading needles, and then bite it off with the teeth, have suffered from lead-poisoning.—*Sanitary News.*

* Abstract of a paper by H. W. JONES, F.C.S., read at the recent meeting of the Brit. Pharm. Conference.

A Substitute for Glass.

THE new translucent substance intended as a substitute for glass has been adopted for some months in some of the public buildings of London, and various advantages are claimed for it, among these being such a degree of pliancy that it may be bent backward and forward like leather, and be subjected to very considerable tensile strain with impunity; it is also almost as transparent as glass, and of a pleasant amber color, varying in shade from very light golden to pale brown. The basis of the material is a web of fine iron wire, with warp and weft threads about one-twelfth of an inch apart, this being inclosed, like a fly in amber, in a sheet of translucent varnish, of which the base is linseed oil. There is no resin or gum in this varnish, and, once having become dry, it is capable of standing heat and damp without undergoing any change, neither hardening nor becoming sticky. Briefly, the manufacture is accomplished by dipping the sheets edgewise into deep tanks of varnish, and then allowing the coating which they thus receive to dry in a warm atmosphere. It requires somewhat more than a dozen of these dips to bring the sheets to the required degree of thickness, and, when this has been accomplished, the material is stored for several weeks to thoroughly set. This fabric might be worth testing for those parts of studios through which a subdued light only is desired. As the substance contains no resin and is practically solidified balloon varnish, there may be hopes of comparative durability.—*Photo. News.*

Examination of Commercial Peptones.

THE methods hitherto in use for estimating the soluble and non-coagulable proteïds (the albuminoses and peptones) are far from satisfactory. The precipitation of the albuminoses by ferric acetate, with subsequent precipitation of the peptones by sodium phosphotungstate, yields very discordant results. J. Koenig and W. Kisch adopt the method of Kühne and Chittenden—precipitation of the albuminoses with a saturated solution of ammonium sulphate, and in another portion of the precipitation of both albuminose and peptone by sodium phosphotungstate, and estimation of the peptone from the difference. From 5 to 20 Gm. of substance (according to the proportion of water it contains) are taken. The insoluble matter and coagulable albumen are separated by filtration and by boiling, and their amount determined. This is preferably effected by Kjeldahl's nitrogen process. Multiplication of the nitrogen found by 6.25 gives the amount of albumen more correctly than direct weighing. The filtrate is made up to 500 C.c. : of this 50 C.c. or 100 C.c. are evaporated to about 10 C.c. of a saturated solution of ammonium sulphate in the cold. The precipitate is filtered off, washed with ammonium sulphate solution, dried, and weighed, and the ammonium sulphate adhering is ascertained by a sulphuric-acid determination and deducted. Of the same filtrate 50 C.c. or 100 C.c. are acidified with sulphuric acid, and precipitated with a strongly acid solution of sodium phosphotungstate. The precipitate is washed with dilute sulphuric acid, and the nitrogen it contains is determined. Although albuminose and peptone contain less nitrogen than albumen, the same multiplier should be used, as this will to some extent compensate for the traces of other nitrogenous substances precipitated at the same time.

Salkowski gives the following differences between albumen-peptone, gelatin, and gelatin peptone (a 3½–5 per cent solution being used):

	Albumen-peptone.	Gelatin.	Gelatin-peptone.
5 vols. of glacial acetic acid and 5 vols. of sulphuric acid mixed.....	violet	yellowish	yellowish
An equal volume of concentrated sulphuric acid in the cold.....	dark-brown	yellow	yellow
Millon's reagent.....	reddish p. p.	colorless	colorless
Solution boiled with ⅛ vol. of nitric acid (1.2), then made alkaline with soda	deep orange	lemon-yellow	lemon-yellow

—*J. Chem. Soc.*

Stockman's Test for the Purity of Cocaine.

DR. RALPH STOCKMAN has proposed the following test for ascertaining the purity of cocaine:

When pure cocaine is heated with strong hydrochloric acid in a sealed glass tube in the water-bath, it splits up into its components without any change of color, except a very light yellow tint. When isatropylcocaine is so treated, it splits up into ecgonine and a brown, oily-looking body, which is decomposed isatropic acid. With long boiling a black body is deposited. Upon trying this reaction, Dr. Squibb found that the sealed tube and water-bath were not essential, and that the process might be

very useful as a test for the purity of cocaine. He accordingly directs 5 Gm. of the powder and 2 C.c. of strong hydrochloric acid to be put into a small test tube and carefully warmed over a gas flame until the decomposition is complete, as indicated by the end of the effervescence and the commencement of boiling. Perfectly pure cocaine, or hydrochlorate of cocaine, when thus treated yields an almost colorless solution, and the depth of color indicates the amount of impurity. The best crude cocaine yet met with gives a color of the depth of ordinary brandy, but a large proportion of the parcels give solutions many shades darker, and some of the earlier and worst specimens give black solutions. Good hydrochlorate of cocaine tested in this way gives a nearly colorless solution, or, at most, a pale wine tint. On standing for a few hours, these solutions give fine groups of crystals.

Antipyrine and Some of its Reactions.

1. *Antipyrine and Iodine.*

MANSEAU contributes a paper to the *Apotheker Zeitung* concerning the relations of antipyrine and iodine, from which the following is abstracted: If, to a solution of antipyrine, iodine in solution be added drop by drop, the mixture remains clear and the iodine is chemically united with the antipyrine. Suddenly the conditions are altered, the liquid takes on a reddish-brown color, and a permanent precipitate is thrown down. The author takes this reaction as the base of a process for testing the purity of antipyrine and the demonstration of its presence in urine.

2. *Determination of the Value of a Sample of Antipyrine.*

According to the same author, 1 Gm. of antipyrine is dissolved in 100 Gm. of water, 10 C.c. of a 1-per-cent starch solution are added, and the whole heated to 40° to 42° C. (104° to 109° F.). From a burette, an iodine solution containing 14.39 Gm. of free iodine to the liter is allowed to flow into the heated mixture, drop by drop, until a permanent blue coloration is obtained. Pure antipyrine should require 6 C.c. of such a solution (or 0.08634 Gm. of free iodine) to produce this reaction. While chlorine and bromine solutions give the same reaction, preference is given to iodine on account of the constancy of the titration possible with the latter.

3. *Determination of Antipyrine in the Urine.*

The same author states that he has no objection to the test hitherto used for this purpose (to wit, the chloride-of-iron test), except that it is not sufficiently delicate. Urine that contains less than 20 or 25 Cg. of antipyrine to the liter (say 3 or 4 grains to the quart) is not affected by it, while mere traces are demonstrated by the iodine reaction. The following is the method of procedure:

From 10 to 20 C.c. of urine are put into a test tube, and a few drops of an iodo-iodide solution (iodine 12.5 parts, iodide of potassium 25 parts, water 1,000 parts) are added. If no precipitate follows, no antipyrine is present. If any precipitate which does not vanish on agitation be formed, we may reckon upon the presence of alkaloids (quinine, strychnine, etc.). If the precipitate be again taken up on agitation, it is possible, on the contrary, that, instead of antipyrine, certain ferments are present. In this case, proceed by adding for each 10 C.c. of a fresh sample of the urine 2 minims of nitric acid and 10 minims of the iodine solution. Ferments give only a slight perturbation of the fluid, while antipyrine gives a rich, dark-red precipitate. If it be desirable to make absolutely certain of the result, take 10 C.c. of the urine, add 2 or 3 C.c. of starch solution, and then the iodine solution drop by drop, until a permanent blue is obtained. If antipyrine be present, the blue color will vanish on heating the mixture, giving place first to a violet, and finally disappearing altogether.—*Nat. Drugg.*

Mr. James Kennedy, of San Antonio, Texas, read a paper, at the last annual meeting of the Texas Pharmaceutical Association, on the subject of antipyrine, from which we take the following passages referring to reactions of antipyrine:

I have endeavored to utilize the incompatibility of nitrous ether with antipyrine in the quantitative estimation of ethyl nitrite, but in this attempt I have met with only partial success.

Operating upon a strictly pharmacopœial preparation recently made, I found that, with 9 C.c. added to 2 C.c. of a 4-per-cent solution of antipyrine, the mixture diluted with 15 C.c. of water, and heated just to ebullition, and allowed to stand from thirty to forty-five seconds, a distinct green coloration results. I found, further, that a smaller quantity of the preparation will not produce the green coloration within the prescribed time, requiring, instead of one and one-quarter minutes, from two to ten minutes or more.

In order to obtain accurate results, it is necessary to observe the following conditions: Take a tube 15 Cm. in length and about 12 Mm. in width; pour into it 2 C.c. of an aqueous 4-per-cent solution of antipyrine, add 15 C.c. of water, and place the tube in the flame of an ordinary spirit lamp, holding it in an inclined position, so that the flame shall come in contact with the tube midway between the meniscus and bottom of the tube; heat for one-half minute, revolving the tube in the flame; place the tube against a white background and let it stand three-quarters of a minute, and the green color becomes distinctly perceptible, most marked in the middle and upper half of the tube.

This test, however, is only available for determining whether the specimen is up to standard or below it. With a weaker preparation than the officinal, the increased volume of alcohol retards the reaction for so long a time that the utility of the test is destroyed.

A Test for Antipyrine.—The facility with which ethyl nitrite decomposes in the presence of water makes it an admirable reagent for the detection of antipyrine in solution, producing a well-marked and characteristic reaction with 1 part of antipyrine to 5,000 parts of water. As the presence of alcohol has a retarding influence in the decomposition, upon which this test depends, pure ethyl nitrite should be used.

It is only necessary to add the ethyl nitrite to the solution of antipyrine contained in a tube, and agitate, when a distinct green coloration will be produced, the intensity varying, of course, according to the amount present. With amyl nitrite this action is not so delicate.

Dr. Conquil, in the department of New Remedies ("Wood's Medical and Surgical Monographs"), March, 1889, says: "The most palpable reaction of antipyrine is the reddish-brown precipitate which it gives in the presence of potassium iodide." This is clearly an error; for in the presence of potassium iodide alone no precipitation occurs. A reddish-brown precipitate is produced by a solution of free iodine, however, and this probably is the explanation of his mistake. But in the same article the doctor recommends a gargle consisting of antipyrine, tincture of iodine, and potassium iodide, which prescription is incompatible, and will furnish an abundance of the reddish-brown precipitate which he attributes to potassium iodide.

As previously stated, antipyrine treated with Nessler's reagent (mercur-potassic iodide) gives rise to a new compound of a peculiar character. On admixture of the two, the solution becomes opaque, and after a time separates into two distinct strata—the lower one very dense and heavy, oily in appearance, clear and of a yellow color. It is decomposed by water, becoming opaque and depositing a yellow precipitate which afterwards becomes scarlet.

It is miscible with alcohol without decomposition.

Treated with chlorine water it is decomposed, liberating iodine.

This interesting compound contains mercuric iodide in considerable quantity united with antipyrine, and the precipitate obtained by treating the supernatant fluid (from which mercuric iodide has been separated by the dilution with water) with tincture iodine indicates that the compound resolves itself into antipyrine and mercuric iodide.

Mercury Benzoate.

ONE hundred and twenty-five parts of mercuric oxide are dissolved in 250 parts of nitric acid (1.20 sp. gr.), the solution diluted with 4,000 parts of water and filtered; to this a solution of 188 parts of sodium benzoate in 4,000 parts of water is gradually added with agitation. The voluminous precipitate of mercuric benzoate obtained, after washing, pressing, and drying, forms a light, white powder, soluble with difficulty in ether, alcohol, chloroform, and water.—E. LIEVENTHAL in *Ph. Zeit. f. Russl.* (and *J. Soc. Chem. Ind.*)

Cologne-Water.—T. Vyncer, of Nice, sends the following to the *Chemist and Druggist*, concerning which he says that in the distillation the neroli is not mixed with the other ingredients, but added to the distillate. The essences are in the proportion of 1 in 72 only, and everything depends upon their freshness and quality:

	Parts.
Ess. Portugal	15
" Lemon	15
" Bergamot	6
" Neroli	1
" Petitgrain	1.50
" Rosemary	2
Spt. Wine	4,000

1 part essence in 100.

Test for Senega.—L. Reuter, of Heidelberg, offers the following test for the chemical identification of senega root, which is based upon the quite constant presence of methyl salicylate: 5 Gm. of dried and powdered senega are macerated for fifteen minutes with 50 C.c. of water, temperature about 60° C., filtered, the filtrate acidified with 3 drops officinal hydrochloric acid, and agitated with 50 C.c. of ether; the ethereal layer is decanted, and the ether allowed to dissipate spontaneously. There should be sufficient residue so that when treated with 20 C.c. of water at 60° C., and the solution with 1 drop of ferric chloride solution, a distinct violet color should be developed.—*Chem. and Drugg.*

Medicamentous Eruptions.

In his inaugural thesis for the doctorate, under the title of "Medicamentous Eruptions," Dr. Deschamps thus summarizes the common characters and the course of the eruptions which may follow the administration of a medicament. Among the medicaments the employment of which may determine erythematous eruptions, the list is headed by copaiba, then follow belladonna, sulphate of quinine, turpentine, stramonium, protoiodide of mercury, bromide of potassium, syrup of poppies, the preparations of arsenic, etc. Those which produce vesiculous affections are bromide of potassium, the alkaline iodides, cubebs, santoninate of soda. Those which give rise to pustulous affections are the iodides, arsenic, bromide of potassium. The papulous affections are produced by Fowler's arsenical solution, and by hydrochlorate of morphia in hypodermic injections. Bullous affections are produced by copaiba and sulphate of quinine. Hæmorrhagic affections are produced by sulphate of quinine and iodide of potassium. It may be seen from the above enumeration that the same medicamentous substances may give rise to different cutaneous affections, whence it may be concluded that the effects which are always due to the same physiological procedure, viz., the elimination of the medicament by the skin, vary a good deal as regards the different forms of eruption, according to the aptitudes of receptivity of individual idiosyncrasies. It goes without saying that the treatment of these eruptions should consist in the momentary cessation, or at least in the diminution, of the doses of the medicament, its suppression not being effected always without grave inconvenience.

Incense for Churches.—Gum olibanum, 9 ounces; benzoin, 5 ounces; storax, 2½ ounces; sugar, 2 ounces; cascarilla, 1½ ounces; saltpetre, 3 ounces. Powder and mix.—*Chem. and Drugg.*

Snuff for Cold in the Head.—Rabow declares that a snuff made of 2 parts of menthol, 50 parts finely ground coffee, and 50 parts powdered sugar is a sovereign remedy against fresh colds in the head.

To Prevent Bumping during Distillation.—Parkhill (*Pharm. Era*) recommends roughening the interior of flasks used for distillation by introducing a small amount of fluorspar with sulphuric acid and then warming. As soon as the hydrofluoric acid has acted upon the interior surface, the flask may be emptied and washed. With such a flask, the writer says, bumping is entirely prevented.

Dextrin, free from sugar, is proposed as an efficient substitute for gum arabic, and a German patent covering its manufacture has lately been issued. Starch is mixed with cold water to a consistence of thick cream and treated with 1 per cent of mineral acid. After twenty-four hours the acid is removed by washing, and the starch is again mixed with water to a cream and heated to 160°–170° C. by means of superheated steam until all the starch is converted. The solution is then filtered and dried by evaporation.

A New Fothergill Pill.—John Aulde, M.D., gives in the *Medical and Surgical Reporter* of September 14th a résumé of the history of the so-called "Fothergill's Pill," and suggests its modification as follows:

Strychnine Sulphate	gr. $\frac{1}{30}$
Powdered Ipecacuanha	gr. $\frac{1}{2}$
Powdered Black Pepper	gr. $\frac{1}{2}$
Extract of Gentian	gr. 1
Oil of Cloves	gtt. $\frac{1}{20}$

M. et fiat pil. no. 1. Sig. Take after each meal.

Balm of Gilead Salve.—Mutton tallow, ½ pound; balm of gilead buds, 2 ounces; white pine gum, 1 ounce; red precipitate, ½ ounce; white sugar, 1 tablespoonful. Stew the buds in the tallow until the strength is obtained, and press out or strain, scrape the soap, and add it, with the other articles, to the tallow, using sufficient unsalted butter or sweet oil to bring it to a proper consistence to spread easily on cloth. When nearly cool stir in the red precipitate, mixing thoroughly. This may be more appropriately called an ointment.

This is an old-time remedy, having been used in this country for about fifty years.—*Formulary.*

Composition of Washing Powders.—L. O. Janeck and E. M. Poset, of the Wisconsin School of Pharmacy, have examined a number of the popular washing powders sold in the United States, and report their results in the *Western Druggist.* "Pearline," sold in pound packages at 15 cents, consisted of anhydrous soda 52¼ per cent, soap 35 per cent, and the rest water lost in drying. "Soapine," sold in 6-ounce packages at 5 cents, "Boraxine," "Gold Dust," "Ivorine," "Babbitt's 1776 Soap Powder," and "Acme Soap Powder" were all similarly composed, though the proportions of soap and soda varied to some extent. A sample of a certain "washing crystal," retailing at 3 cents for 2 ounces, was effloresced soda simply.

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EDITORIAL.

As the time approaches for the Convention to provide for revision of the Pharmacopœia, the difference in the attention paid to it by pharmacists and by physicians becomes quite notable. While nearly every pharmaceutical society and journal in the country has given an expression of views regarding one or more of the questions involved, hardly a medical society or journal has given it passing notice, and one would infer from their apathy that physicians have no interest in standards of purity and strength for the articles which they are compelled daily to use.

The proverb that although you may lead a horse to water you cannot make him drink, is applicable to the present situation; for, although provisions may be made for a proper representation of the medical profession in the revision of the Pharmacopœia, no one can oblige its members to take part in the work.

While the number of articles on the subject of the next revision which have appeared in pharmaceutical journals is already considerable, it is a matter of some moment that so few are of much practical importance, and that so many put the cart before the horse by discussing such matters as the price of and manner of publishing the book, or details which the Convention or committee will be quite competent to arrange when the time comes for doing so; whereas the matters of real importance—such as the articles to be included, nomenclature, details of working formulas, percentage of active ingredients, methods for assuring uniformity and permanence of products—receive comparatively less attention.

Much of this may be owing to the assumed necessity for a certain amount of editorial comment in each issue upon questions of the day; in other cases, it is evidently with a view to keeping the writer and his personality in the minds of the readers and for purposes of advertisement.

Among the things to be regarded in the forthcoming revision should be the avoidance, as far as possible, of sectional, professional, or personal bias in the preparation of the work, and when it is completed it should show, as little as possible, favoritism of the interests of any one of these classes.

Those who remember the circumstances attending the Convention of 1880 know the effort then made to take the management of the Pharmacopœia out of the control of a private publication, and it is to be hoped that in the Convention of May next it will be decided to distribute the responsibility for the character of the next revision over a still wider field.

It must be noted that the number of bodies entitled to send delegates is very considerably greater than ever before, not only under the former limits, but by the vote of the last Convention, and there is now no obstacle to prevent *all* the incorporated medical societies in the country—eclectic, homœopathic, and others—having representatives in the Convention.

WITH the aid of the hektograph, it was demonstrated to the present Committee of Revision that it is no longer requisite that a majority of the Committee should be within convenient travelling distance of each other, and, by its use, that every member of a large committee can not only be kept informed of the progress of the work, and be able to freely express his views, but also have in his constant possession a complete record of all that is being accomplished.

EDISON'S phonograph has scarcely, as yet, passed the period of "novelty and curiosity," but many practical applications of the instrument have already been suggested, and have in some cases been actually carried out. There is one application, however, which we have so far not heard mentioned, and that is the instruction in the pronunciation of foreign languages. It is impossible to learn to speak a foreign modern language by self-instruction, since the true pronunciation can only be acquired by personal intercourse with one who is a native or equal to one in linguistic perfection. In the future the publishers of manuals of instruction in foreign languages will find it, most likely, a paying undertaking to publish a phonographic key of the various exercises, thus enabling the learner to acquire the correct intonation and pronunciation by causing the phonograph to repeat the word or sentence until it has been perfectly imitated by himself. Perhaps this suggestion may be thought to be foreign to the purposes of a pharmaceutical journal. But our profession is so situated, in many parts of the country, that a knowledge of more than one language is almost a necessity. And while actual instruction by a competent teacher is certainly the best method, the substitution of the phonographic method appears to us to be the next best in choice. We can only throw out the suggestion here, and must leave the practical execution to those who control the phonograph.

THE latest addition to drugstore facetiæ was given to us quite recently by the proprietor of a store in a fashionable locality, to whom came a lady with a manner which indicated a belief on her part that her patronage was the most important thing connected with the establishment, and a request for "two postage stamps, please." The postage stamps being given her, she asked their cost, and, this being stated, her next inquiry was to ask if the clerk was "quite *sure* that they were perfectly fresh"!

WE should have acknowledged our indebtedness to the *National Druggist* for the text of the decision by Judge Thayer, published on page 197 of our last issue.

Dr. George Buck, of Chicago, died on the 2d of October at the age of sixty-two years. Mr. Buck was born in Rochester, England, and came to the United States in 1855. His pharmaceutical training was acquired in England, and on his arrival here he became connected with the firm of J. H. Reid & Co., of Chicago, as prescription clerk. In 1859, with Mr. Raynor, also a clerk in the same house, he commenced business for himself. Mr. Buck was one of the charter members of the Chicago College of Pharmacy and its president from 1886 to the time of his death. He was a prominent actor in the movement which resulted in the enactment of the Illinois pharmacy law, and was the first president of the State Board of Pharmacy. He was well known by the public as well as by members of his profession as a man of great integrity and ability, and his death is a decided loss to the community in which he lived.

CORRESPONDENCE.

"Bromidia" and the United States Court.

ST. LOUIS, Oct. 21st, 1889.

GENTLEMEN:—We notice in the October number of the AM. DRUGGIST an article on the Bromidia cases, which was copied from the September number of the *National Druggist*. As the editor of the *National Druggist* has seen fit to make a correction in his journal of Oct. 15th, we hope you will be kind enough to do the same. The following is a copy of the correction (see *Nat. Druggist*, Oct. 15th, p. 131).

Yours respectfully,
C. A. BATTLE, V.-P.

A very mistaken idea as to the scope of the recent decision in the United States Circuit Court in the so-called "Bromidia cases" seems to have gotten abroad, and unless corrected may be the means of costing some of our friends among the retailers considerable money and trouble. Judges Brewer and Thayer, before whom the case against August Koch came up, did not decide that "Bromidia" was not a valid trade-mark, as one pharmaceutical journal states editorially, nor did they decide that the owners of trade-marks have no recourse against infringers, as another journal puts it; but they did decide that such infringers could not be prosecuted under criminal indictments. The grounds upon which this decision was rendered were, as stated in our last issue, that the statute of 1876 (which prescribes the method of procedure, and the penalties, in cases of violation of the trade-mark law of 1870), under which the indictments of Koch and others in the Bromidia matter were drawn, was void; that Congress had no power to pass such a law, because at the time of its enactment there was nothing upon which the act could operate. In other words, the judges (Judge Brewer delivering the opinion) took the view that the statute of 1870 having become defunct, by repeal, the act of 1876 providing criminal punishment for its violation was inert and void. This is not a new view of the matter by any means, but, as noted by Judge Brewer in his decision, was but a reassertion of the decision in the "trade-mark cases" of 1882. The decision in the Federal Court cannot, of course, affect proceedings under the State laws on the subject, nor does it in any way prevent the owners of a trade-mark from suing infringers for damages.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,384.—**Chemical Journals** (A. E. W., Raleigh, N. C.).

The *Chemist and Druggist* is published at 42 Cannon street, London, England, but has an agent, Mr. H. V. Dakers, at 45 Liberty Street, in this city.

The *Journal of the Society of Chemical Industry* is a monthly publication, especially valuable for those engaged in manufacturing. It should be addressed care of Eyre & Spottiswoode, East Harding Street, London, England.

The *Journal of the American Chemical Society*, likewise a monthly publication, can be highly commended, and may be addressed at 32 Waverly Place, New York City.

No. 2,385.—**Metabisulphite of Potassium** (Amateur).

We have already given such information as was then accessible to us, in a former issue of this journal (see our last January number, page 20, and February number, page 39). Recently we learn that the salt was introduced into the market by Schuchardt, chemical manufacturer at Goerlitz, Germany. It may be had here from dealers in photographic chemicals.

No. 2,386.—**Chloral-Urethane** (Dr. F. G. S. and J. C. C. & Co.).

In our last number we answered a query (No. 2,373) referring to this substance. Since writing that answer, however, our attention has been drawn to the fact that there are at present not less than *three* different "chloral-urethanes" in the market, of which we give a short account in the following (Nos. 1 and 2 after Merck's Bulletin, July, 1889, and No. 3 after Gehe's October Report and a note in the *Chem. and Drugg.*):

1. *Chloral-Urethane*, crystalline, insoluble in water.

This is stated to be produced by the simple addition of 1 molecule each of chloral (anhydrous) and ethylic urethane (the ordinary urethane). Hence its constitution is represented by the formula:

$$\underset{\text{chloral}}{CCl_3.CHO} \;.\; \underset{\text{urethane}}{NH_2.CO.OC_2H_5}$$

As we stated in our last number, this is insoluble in cold water, and when treated with boiling water decomposes into its two original constituents. Alcohol and ether readily

dissolve it, and water separates it again from these solutions. It melts at about 103° C. (217° F.), but begins to be decomposed already at 100° C. The dose, as a hypnotic, was found by Hübner and Sticker to be 1 to 4 Gm. (15 to 60 grains).

2. *Uralium* (so called by its originator, Gustavo Poppi). This is reported to be likewise a chloral-urethane of the same ultimate chemical composition as No. 1. But as its properties differ, the grouping of the constituents must be different.

This substance is crystalline, of a bitterish taste. It is somewhat soluble in water, and readily so in alcohol.

The hypnotic dose was found to be 2 to 3 Gm. (15 to 45 grains).

3. *Somnal.* This is also reported to be a chloral-urethane, but its composition is given as $C_7H_{12}Cl_3O_3N$, thus containing 2 more atoms of carbon and 4 more of hydrogen than chloral-urethane No. 1.

This is a liquid, clear and colorless, easily soluble in water and alcohol, according to Gehe & Co., who quote it in their price-list at 3.75 marks per 100 Gm. According to the *Chem. and Drugg.* it "has a melting-point of 40° C.," which would imply that it is a solid at ordinary temperatures. We have not seen it yet, and cannot say which is correct. The hypnotic dose is stated to be 2 to 6 Gm. (30 to 90 grains).

All of these new hypnotics are quite expensive as yet, and not sufficiently tried to justify their promiscuous use. If "chloral-urethane," without further specification, were ordered, we would dispense No. 1, as this seems to be known under no other name.

No. 2,387.—**Tincture of Nux Vomica** (J. M. D.).

A dispute has arisen between one of our subscribers and a physician regarding what should be the proper tint or color of tincture of nux vomica prepared in accordance with the U. S. Pharm. of 1880.

Evidently one of the gentlemen interested had been accustomed to the comparatively pale color of the tincture as made, in accordance with the previous Pharmacopœia, by percolation of alcohol through the powdered seed. This always yielded a pale tincture, about the tint of pale sherry, and sometimes even lighter. The U. S. Ph. of 1880 directs the tincture to be made from the extract, so that the product will contain 2 per cent of the dry extract. Now, in preparing an extract of nux vomica, much more soluble matter including coloring matter (but not necessarily more *active* constituents) is taken out of the seed than is done when making a tincture by percolation. Hence by dissolving the directed quantity of *extract* in alcohol, the tint of the resulting tincture is very much darker than that of the tincture prepared by direct percolation. Besides, while both the tincture and the extract of nux vomica of the U. S. Ph. of 1870 were prepared by means of strong alcohol, the menstruum directed by the Pharm. of 1880 consists of 8 parts of alcohol and 1 part of water. Such a menstruum dissolves much more of the "extractive" and coloring matter than strong alcohol. It is difficult to describe a color without having a definite standard to refer to. But the tincture which we make according to the U. S. Ph. of 1880 has about the same depth of color as old port wine, and the tint is reddish-brown.

No. 2,388.—**Hair Tonic** (M.).

The popular notion of a hair tonic is this: that the preparation will prevent hair from falling out, make hair grow faster, and even cause hair to grow on bald spots of the scalp. In many cases there is, indeed, some benefit derived from the use of judiciously selected preparations, but when the vitality of the follicles is once destroyed there is no remedy which will restore it. When the skin is very dry and the scalp not kept clean, hair will often break off close to the scalp, and this may lead to the supposition that the hair is "falling out." Whenever the hair of the head has a tendency to become "dry" and brittle, and when the scalp feels hot and dry, the application of a preparation like the following will often be beneficial:

Castor Oil	24	fl. oz.
Alcohol	96	"
Tincture of Cantharides	2	"
Borax	1	tr. oz.
Water	4	fl. oz.
Oil of Lavender	1	"
" " Bergamot	½	"
" " Cloves	½	"

Dissolve the oils in the alcohol, add the tincture and the castor oil. Dissolve the borax in the water by the aid of heat, and gradually add it to the other liquid, shaking well after each addition.

Some add a small quantity of quinine. If this is desired, it is best to use the oleate of quinine in such proportion that each fluidounce contains about 20 grains of quinine.

If desired, the preparation may be colored slightly by caramel.

No. 2,389.—**Wine of Coca** (W. S. M.).

The National Formulary—which you do not seem to possess as yet, but which you will find of great service—contains a very good formula for this preparation. It is, briefly, as follows:

Dissolve 1 troy ounce of sugar in 10 fluidounces of claret wine, add 1 fluidounce of alcohol and 1 fluidounce of fluid extract of coca (U. S. Ph.), and then add enough claret wine to make 16 fluidounces. Let the mixture stand a few days, if convenient, in a cool place, then filter, and pass enough claret wine through the filter to restore the original volume.

No. 2,390.—**Sulphonal and its Congeners** (Albany).

The pharmaceutical management of sulphonal is somewhat difficult, since it is so little soluble in water. If it is dissolved with the intervention of an alcoholic vehicle, it is more or less precipitated when it comes in contact with the contents of the stomach. It has been shown by Kast and many others that the hypnotic effect of sulphonal is greatly accelerated by giving it in such a form that it will be quickly absorbed. For this purpose, it may be administered in warm tea, or soup, or mulled wine, about an hour or two before bedtime. If it is given in substance, it will usually become so slowly dissolved that the hypnotic effect is either feeble or almost wanting, since it appears to be eliminated quite rapidly. In its passage through the organism it appears to be completely, or almost completely, decomposed, since sulphonal is found in the urine only under certain circumstances—for instance, when given in dilute solution. Incidentally we may remark that there is no reaction known by which sulphonal can be definitely detected. It is one of the most obstinate organic compounds known, resisting strong acids and alkalies, even bromine and chlorine. By fusion with alkalies, certain reactions may be produced, but these it shares in common with a whole class of bodies.

The derivation of sulphonal from alcohol, C_2H_5OH, may be explained in the following manner:

By treating alcohol with sulphuric acid, sulphethylic acid is produced. On distilling the sodium salt of this acid with a strong solution of sulphide of potassium, the principal product obtained is C_2H_5SNa (sodium mercaptide), which, by treatment with benzol and dilute sulphuric acid, is converted into the sulphur alcohol of ethyl, C_2H_5SH, usually known as mercaptan. This has a most disgusting and penetrating odor. On treating 2 molecules of mercaptan with 1 molecule of acetone, there is produced 1 molecule each of "mercaptol" and of water.

$$\underset{\text{acetone}}{C_3H_6O} + 2\underset{\text{mercaptan}}{C_2H_5SH} = \underset{\text{mercaptol}}{C_3H_6.2C_2H_5S} + \underset{\text{water}}{H_2O}$$

The chemical constitution of mercaptol may be more perspicuously explained by the following diagram, in which the central carbon atom, together with the 2 molecules of methyl (CH_3), are the residue of the acetone molecule, while the 2 molecules C_2H_5S are derived from the mercaptan:

$$\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\} C \left\{\begin{matrix}SC_2H_5\\SC_2H_5\end{matrix}\right.$$

Now, when mercaptol is oxidized—for instance, by permanganate—it takes up 4 atoms of oxygen, and becomes

$$\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\} C \left\{\begin{matrix}SO_2C_2H_5\\SO_2C_2H_5\end{matrix}\right.$$

and this is *sulphonal*, or "diethyl-sulphon-dimethyl-methane."

It will be seen that two of the affinities of the central carbon atom are satisfied by 2 atoms of methyl, and the other two affinities by 2 molecules of the group SO_2, each in combination with an atom of ethyl. We may be permitted, at least provisionally, to regard sulphonal as being composed of the quadrivalent group

$$= C(SO_2)_2 =$$

in which one pair of bonds is saturated or satisfied by methyl, and the other pair by ethyl.

Recently the discoverer of the therapeutic action of sulphonal, Dr. A. Kast, in conjunction with Dr. E. Baumann, has studied a series of analogous compounds in which the several bonds of the group $C(SO_2)_2$ were saturated with various radicals of the fatty series, and very interesting and important results were obtained. The method by which these several compounds were obtained need not be given here. Among these substances, the following two deserve special mention:

$$\left.\begin{matrix}C_2H_5\\CH_3\end{matrix}\right\} C(SO_2)_2 \left\{\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right.$$

Here we have three bonds saturated by ethyl and only one by methyl. The proper chemical name of this substance is "di-ethylsulphon-methylethyl-ethane," but the authors propose to call it for short *trional* (meaning that it is a sulphonal-like body, having *three* ethyl groups). And another:

$$\left.\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right\} C(SO_2)_2 \left\{\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right.$$

This compound they name *tetronal*, since it contains *four* ethyl groups. To carry out the analogy, it might be suggested that sulphonal proper

$$\left.\begin{matrix}CH_3\\CH_3\end{matrix}\right\} C(SO_2)_2 \left\{\begin{matrix}C_2H_5\\C_2H_5\end{matrix}\right.$$

be called *dional*, as it only contains *two* ethyl groups.

Now, the two substances, trional and tetronal, have been found to be even more powerful hypnotics than the ordinary sulphonal, the most powerful being tetronal.

It is probable that one or two of these bodies will shortly make its appearance on the market.

By varying the radicals, either derived from the fatty or from the aromatic series, a large number of combinations may be prepared, among which there may be found still more useful therapeutic agents than those above mentioned.

No. 2,391.—**Creosote** (J. M. S.).

The tests given by the U. S. Pharm. are sufficient to distinguish between genuine wood-tar creosote and carbolic acid. The latter has, unfortunately, been carried on the price lists of many manufacturing and wholesale houses as "coal-tar creosote," and it has been the custom, particularly among European Continental houses, to supply this (carbolic acid) when "creosote" without further specification was mentioned. Indeed, this is even now done by one of the most prominent makers of chemical products, to judge from the fact that his price list quotes three kinds of creosote: one, designated as "pure," made from beech-tar, and the other two, respectively as "pure, white, true," and "chemically pure, white, true," made from coal-tar. It is under all circumstances advisable, when ordering creosote from a dealer, to specify particularly either "U. S. Pharm." or "from beechwood tar." The sale of "coal-tar creosote" in place of the officinal article is, at the present time, almost criminal, since creosote is now being largely used in the treatment of phthisis, and often in doses which would be dangerous if phenol or carbolic acid were substituted for it.

The constituent upon which the special therapeutic effect of creosote depends—and which is utterly absent in carbolic acid—is *guaiacol*. This is the methylic ether of pyrocatechin:

$C_6H_4.OH.OH$ pyrocatechin $C_6H_4.OH.OCH_3$ guaiacol.

It is, when pure, a colorless, oily liquid, highly refractive, of a peculiar aromatic odor, and having a spec. grav. of 1.1171 at 13° C. It boils at 201° C. [394° F.], is soluble in 200 parts of water, and is clearly miscible with alcohol, ether, or carbon disulphide. On adding a little ferric chloride to its alcoholic solution, the latter turns blue. A larger quantity of the reagent produces a green color. According to Merck's Bulletin (No. 8, from which we take some of these notes), 1 volume of guaiacol, when added to 2 volumes of petroleum benzin, produces a *turbid* mixture, which, however, becomes *clear* at 15° C. (59° F.) on adding 6 more volumes of benzin. *One* volume of guaiacol with 2 volumes of soda solution makes a *clear* mixture. This mixture is soluble in ten times its value of water to a clear and colorless liquid. On adding 2 volumes of solution of potassa [of about 15 per cent] to 1 volume of guaiacol, the mixture soon solidifies to a white, crystalline mass.

Among the formulæ recommended for its administration are the following:

℞ Guaiacol ..... gr. 15
Alcohol ..... fl. oz. 8
Tinct. Gentianæ ..... fl. oz. 1
(Nobili.)

Dose: At first 5–15 drops after each meal, best taken in wine, broth, or sugared water. The dose may gradually be increased up to 30 and even 50 minims of the mixture per day.

Dr. Bourget recommends the remedy in larger doses. In summer, he gives it in vinous solution; in winter, in combination with cod-liver oil.

The summer mixture is as follows:

℞ Guaiacol ..... min. 120
Tinct. Cinchonæ ..... min. 360
Vini Malaccensis ..... fl. oz. 35

Dose: One tablespoonful at every meal in the beginning of the treatment. After a while, the dose is gradually increased up to 2–3 spoonfuls.

If not well borne by the mouth, the remedy may be administered by way of the rectum:

℞ Guaiacol ..... gr. 30
Ol. Amygdalæ ..... min. 360
Acaciæ ..... gr. 150
Aquæ dest ..... fl. oz. 32

Make into an emulsion. Administer one-fourth of this in *one* enema.

For the winter treatment the following mixture is recommended:

℞ Guaiacol ..... gr. 45
Ol. Morrhuæ ..... fl. oz. 8

Dose: One tablespoonful at each principal meal, and the following is to be applied, by inunction, to the chest, back, and armpits at bedtime, after which the patient should be well covered up to the throat:

℞ Creosoti ..... min. 300
Ol. Morrhuæ ..... fl. oz. 8

It is stated that creosote from beechwood tar contains between 60 and 90 per cent of guaiacol. If this is so, then it would certainly pay to prepare guaiacol from this source. But so far as is known, guaiac resin is still used as source, the process of preparation being the following:

Guaiac resin is subjected to dry distillation. The heavy oily distillate is dissolved in solution of potassa, diluted, and the volatile oils distilled off. The residue is not quite neutralized with sulphuric acid, the separated oil again dissolved with solution of potassa, and the mixture distilled in a retort. When the milky distillate becomes clear upon addition of a little potassa, it is decomposed by an acid, when crude guaiacol separates. This is dried on a water-bath over sulphuric acid. It is next subjected to fractional distillation, the portion boiling between 190° and 210° C. being received separately. This consists of guaiacol and cresol. To separate the latter, ammonia gas is conducted into the mixture, which converts it into a crystalline mass (only due to the guaiacol). This is quickly pressed, dissolved in a little warm ether, and mixed in a close vessel with alcoholic solution of potassa. The resulting crystalline mass is pressed, washed with ether, then decomposed with sulphuric acid, the oil separated, dried, and rectified.

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UEBER DIE VERBREITUNG CHEMISCHER VERBINDUNGEN IN DER PFLANZENWELT. Von ED. SCHAER [of Zurich]. Reprint from the *Schweiz. Wochenschrift f. Pharmacie.*

AN able review and classification of the chemical compounds occurring in the vegetable kingdom, according to the various groups: alkaloids, acids of the fatty and of the aromatic series, phenols, quinones, ketones, ethereal oils, specific coloring matters, glucosides, bitter principles, etc.

PHARMACOGRAPHIA INDICA. A History of the Principal Drugs of Vegetable Origin met with in British India. By WILLIAM DYMOCK, Brigade Surgeon Bombay Army, Principal Medical Storekeeper to Government; C. J. H. WARDEN, Surgeon Major Bengal Army, Professor of Chemistry in the Calcutta Medical College; and DAVID HOOPER, Quinologist to the Government of Madras, Ootacamund. Part I. 8vo. London and Bombay, 1889.

IN our review of Prof. Dymock's "Vegetable Materia of Western India" (see NEW REM., 1883, page 319), we already expressed our hope that the author would, at some future time, publish a similar work comprising the vegetable drugs of the whole of British India, and we are now pleased to see that this has been undertaken. The task is so large that he has solicited and obtained the aid of two well-known experts, Prof. Warden and Mr. Hooper, and it is to be hoped that the work will be completed in a reasonable time.

The arrangement of the subject matter is by natural families, as in Prof. Dymock's previous work. In the first part, just issued, the medicinal plants belonging to the natural families from Ranunculaceæ to Burseraceæ (according to the system followed in the "Vegetable Materia Medica of Western India") are treated of. Under each plant name reference is made to any existing plates, then the habitat is given, next the vernacular names, the history and uses—in which connection much material is adduced from Oriental writers and other sources not generally accessible or consulted. An encyclopædia of this kind does not admit of being reviewed upon cursory reading. We shall watch its progress with eagerness and interest, and shall have occasion to refer to the contents hereafter.

The work has been printed at the Education Society's Press, Byculla, the resources of which are well known to us. We would strongly urge that the several parts as issued from the press be left *uncut*, since the subsequent binding will reduce the margin of the work too much. Besides, some will probably wish to have the work interleaved.

HANDBOOK OF PHYSIOLOGY. By W. MORRANT BARKER, F.R.C.S., and VINCENT DORMER HARRIS, M.D. Twelfth Edition. Rearranged, Revised, and Rewritten, and with 500 Illustrations. New York: William Wood & Co., 1889. Pp. 784, 8vo.

THIS work, originally known as Kirke's, has so long been considered one of the most valuable text-books that no other remarks are needed beyond the statement that it has been revised to meet the changes which are requisite to bring it up to date.

A MANUAL OF DISEASES OF THE EAR, FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By ALBERT H. BUCK, M.D., etc. New York: William Wood & Co., 1889. Pp. 420, 8vo.

THIS is an enlarged edition of the "Diagnosis and Treatment of Ear Diseases" which appeared in 1880, but has undergone such alteration as to be practically a new work. It is not often that a medical treatise exhibits such painstaking thoroughness regarding all its details, or leaves so little to be desired in the manner of treating the subject referred to.